FINAL PROJECT REPORT - RA.141581

MANHATTAN OFFICE 2100: ARCHITECTURE WITHOUT NATURE

Deddy Laudryansyah Putra
3211100063

SUPERVISOR:
DEFRY AGATHA ARDIANTA, S.T., M.T.

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APPROVAL SHEET

MANHATTAN OFFICE 2100:
ARCHITECTURE WITHOUT NATURE

Written by :

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Has been defended and approved
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ABSTRAK

Kantor Manhattan 2100:
Arsitektur Tanpa Alam

Ditulis oleh:
Deddy Laudryansyah Putra
3211100063

Gaya hidup berbasis bahan bakar fosil seperti pembangkit listrik, transportasi, industri mewariskan krisis iklim untuk miliaran orang di masa depan. Perubahan iklim akan berdampak pada eksistensi kehidupan manusia: ketersediaan pangan, air, infrastruktur, ekosistem, dan kesehatan. Dengan kondisi yang sudah secara (tidak) sengaja kita buat tersebut, pertanyaan selanjutnya adalah: bagaimana 10 milyar manusia bumi pada tahun 2100 menjalani hidup ketika bumi sudah tak lagi layak untuk dihuni?

Berawal dari masalah yang diciptakan oleh kegiatan manusia di era sekarang dan sebuah pertanyaan dasar di atas, lahirlah sebuah gagasan artificial earth. Prinsip utama dari gagasan ini adalah menfasilitasi manusia pada abad ke-22 pada suatu lingkungan binaan sepenuhnya, mengisolasi dan memisahkan diri dari alam yang berada bumi. Kota New York dipilih sebagai tapak karena memiliki skenario abad ke-22 (terkait dengan krisis iklim) berdasarkan penelitian dari EPA (United State Environmental Protection Agency) dan skenario yang berkaitan dengan cara hidup manusia berdasarkan buku Physics of the Future oleh Michio Kaku. Tapak yang telah dipilih menentukan objek bangunan yang digunakan sebagai implementasi ide. Maka dari itu Seagram Building dipilih sebagai objek implementasi ide dan "berkerja di dalam bangunan" sebagai jenis aktifitas yang difasilitasi di dalam bangunan.

Jenis pendekatan yang dilakukan dalam merancang adalah performance based design. Performance based design adalah pendekatan di dalam arsitektur yang menggunakan performa bangunan sebagai petunjuk prinsip desain. Arsitektur menempatkan secara luas performa di atas (atau setara) dengan pembuatan bentuk; memanfaatkan teknologi digital simulasi berbasis performa kuantitatif dan kualitatif, menawarkan sebuah pendekatan baru yang komprehensif untuk mendesain linkungan terbangun.

Kata kunci: perubahan iklim, eksperimental, Seagram Building

ABSTRACT

Manhattan Office 2100:
Architecture without Nature

Written by:
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3211100063

Our fossil fuel-based lifestyles such as electricity, industrial, and transportation is bequeathing a climate crisis to billions of people into the future. The changes will affect existence of human life: human food supplies, water supplies, infrastructures, ecosystems, and health. With the conditions we already (not) deliberately generated, the next question is how will 10 billion people in 2100 live when the earth will has been no longer worthy to live?

Started from the problem that has been created by human's activities nowadays and a basic question above, born the idea of artificial earth. The main principal of this idea is to facilitate 22nd century human in artificial living to alienate and isolate themselves from real earth.
New York City is chosen as the project site because it has 22nd century scenario (related to climate crisis) according to research of EPA (United State Environmental Protection Agency) and 22nd century scenario related to human way of life according to Michio Kaku in Physics of The Future. Selected location determine the building object as the implementation of idea, therefore Seagram Building is chosen as the object of idea implementation and working at the office as kind of activity that facilitated by the building.

The approach that be taken to design is performance based design. Performance based design is approach to architecture in which building performance is a guiding design principle. This architecture places broadly defined performance above, or on a par with, form-making; it utilizes digital technologies of quantitative and qualitative performance-based simulation to offer a comprehensive new approach to the design of the built environment.

Keywords: climate change, experimental, seagram building

FOREWORD

You put a frog in a pot of cold water and turn the heat on.
The water warms so gradually that the frog doesn't notice. It never realizes the precise moment it's cooked to death.
The frog will sit there because it's not able to detect the small changes in temperature that are making his life increasingly dangerous.

And we're in the same sort of situation.

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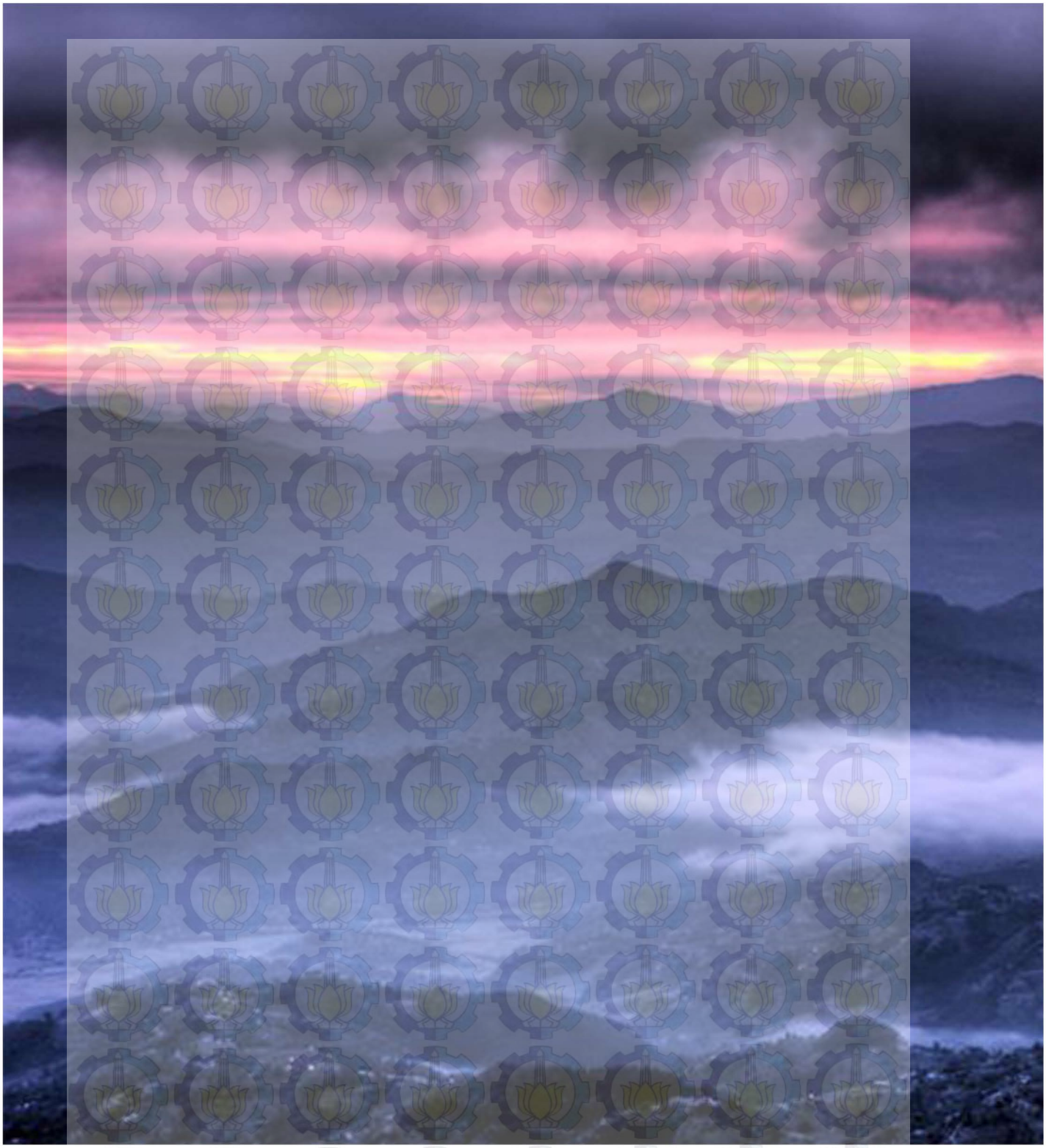
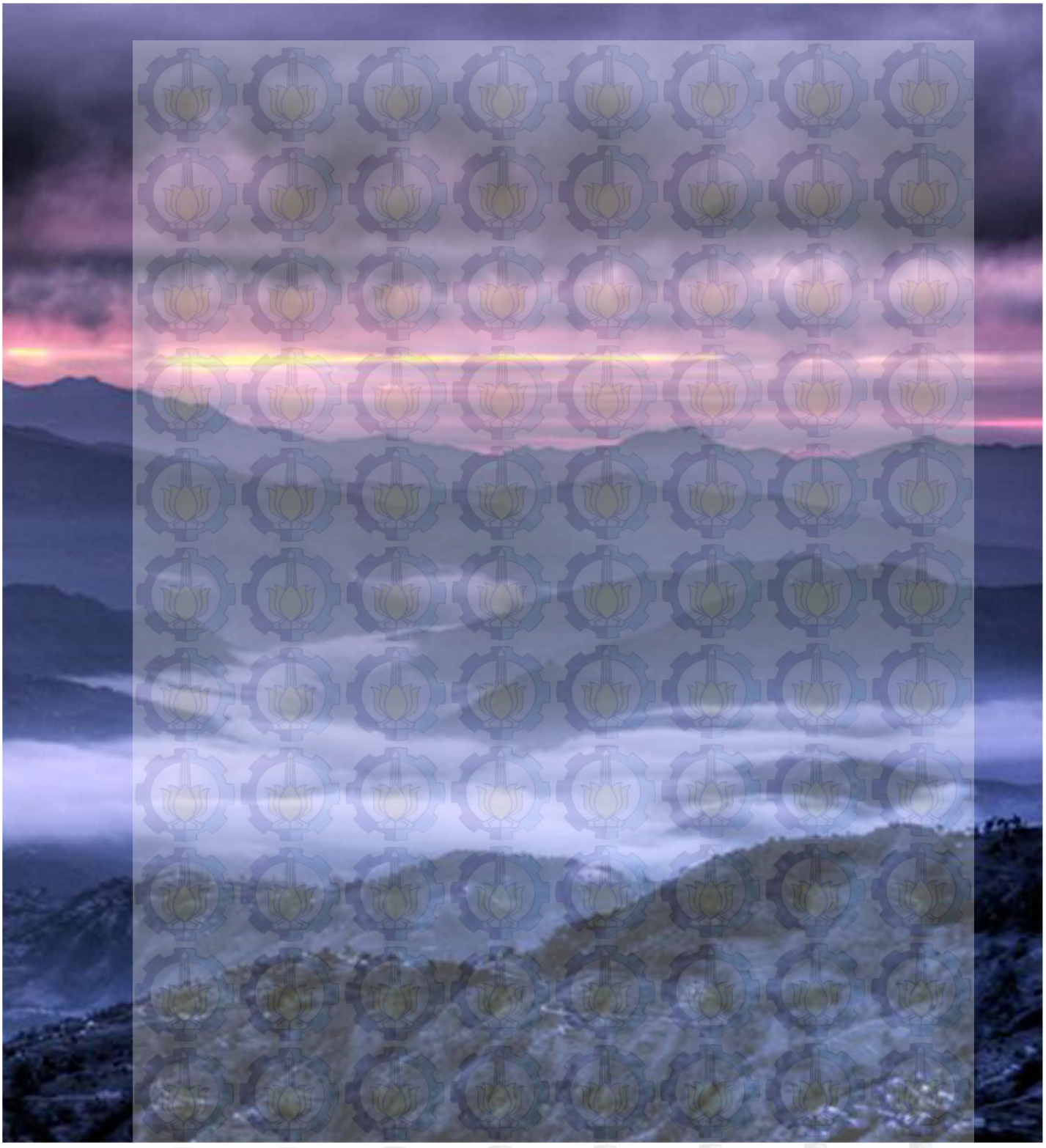


Figure1: Climate Change Illustration. Photo by Mike Behnken

ISSUE

CLIMATE CHANGE: WHAT HAPPENS AFTER 2100?

Some of this future devastation is briefly discussed in the recently updated Copenhagen Diagnosis — a report authored by 26 leading climate scientists with the aim of updating the world on findings since the publication of the IPCC Fourth Assessment Report in 2007. According to this Copenhagen Diagnosis, regardless of when a peak in global emissions finally occurs, the global temperature cannot be expected to stop rising until several centuries later, due to the extremely long life cycle of C02. The carbon that we are releasing into the atmosphere today is in the process of 'programming' a potential 2-5 metres of sea level rise by around the year 2300. The report also states that "even a thousand years after reaching a zero-emission society, temperatures will remain elevated, likely cooling down by only a few tenths of a degree below their peak values." In other words, whatever the mitigation efforts of



future civilisations, climate change is here to stay. Only after this extremely long period of forced warming — far more than the history of modern civilisation since the Scientific Revolution — will climate change slowly begin to 'reverse' and the planet will at last embark on a cooling trajectory, the report explains. But long before this ever happens, humanity must prepare itself for an inland retreat and a constant battle against rising seawater that will continue for hundreds and hundreds of years into the future. The phenomenon of sea level rise resulting from thermal expansion (sea water expands as it warms) and melting ice sheets in Greenland and Antarctica is the perfect illustration of climate inertia in action. What's more, the authors of the Copenhagen Diagnosis warn that sea level rise will continue for many centuries after the eventual stabilisation of global temperature. This is no doubt going to have a devastating impact upon future cities, towns, agricultural areas and freshwater resources located near coastal regions. With those conditions, how will 10 billion people in 2100 live when the earth will has been no longer to live?

RESPONSE

In the present day, the earth may still have remaining of natural resources that could be used to support a human population. But in 2100, when the condition of the earth is no longer habitable, then the only way for humans to survive is to no longer depend on the earth to fulfill the needs. Because if we still rely on the resources of the earth, then the human civilization will as broken as the conditions of the earth. Started from the problem that has been created by human's activities nowadays, born the idea of artificial earth. The main principal of this idea is to facilitate 22nd century human in artificial living to alienate and isolate themselves from real earth because real earth is no longer habitable.

Artificial 'earth' is a new concept of human life form in 2100 that relies on the built environment completely. This notion examines the possibility of human beings to survive in natural conditions that do not allow for inhabited. The idea of such an architecture that isolates human of natural earth, in order to save human lives. The basic concept of artificial 'earth' is separated from the real earth, a concept that is isolating and separating human beings from nature. The word 'nature' refers to the general on the various types of living plants and animals, and in some cases to the processes associated with inanimate objects - about the existence of certain types of an object and how they change by itself, such as the weather and geology of the Earth, and the material and energy of which all these things are composed. Isolating humans from earth nature means that there is no direct contact between humans and nature. In the extreme it can be concluded that: by 2100 humans no longer live on the earth.

SITE SELECTION

Artificial earth is the 22nd century time-based project, indeed availability of the future scenario about what will happen in the site become consideration of site selection. New York City is chosen as the project site because it has 2100 scenario (related to climate crisis) according to research of EPA (United State Environmental Protection Agency) and 2100 scenario related to human way of life according to Michio Kaku in Physics of The Future.

Existing Building

This project uses existing building as implementation of the idea. The reason is because this project needs the building that experiencing the climate change, how it can survive, where is the limit, etc, not a building in a certain climate condition in a certain time. Beside the prediction said that no empty land left in 2100. So that's why this project uses the existing building, and Seagram Building is chosen. Actually any type of building doesn't really matter because the idea implementation doesn't require the specific type of building. But this project is kind of project that based on data, so it needs building with comprehensive datas. Seagram Building has it, since Seagram Building is famous and well-known building.

Figure2: Map of Manhattan

Manhattan 2100

The city was abandoned and nature took over quickly as it always has. And it wasn't just the city. Humans whole way of life had crumbled. The breakdown would be rather rapid. The flooding of Manhattan would have a real destabilizing effect. The subway tunnels would flood and they would stay flooded. The column that hold up the streets, they're steel, they will rust, they will corrode. The streets above them start caving in, and low and behold, we have surface rivers once again in Manhattan.

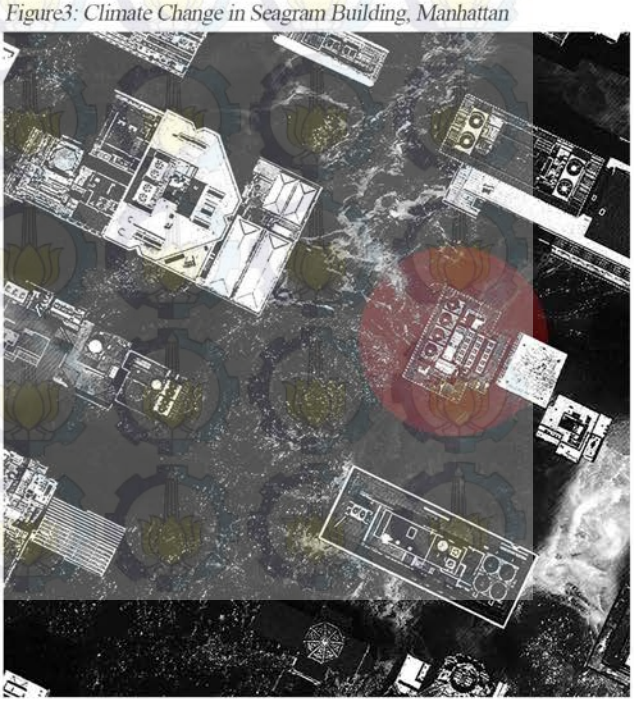
On the other hand, the new city infrastructures have been built above the city. Roads, pedestrian ways, and many other transportation systems were placed in the tubes, because of safety. So many tubes fill the air, connected a building to other one. The energy source used is all from the sun. By the end of the 21st century, energy source has been found: energy from

Site Description

The Seagram Building is a skyscraper, located in Midtown Manhattan, New York City. The structure was designed by German architect Ludwig Mies van der Rohe while the lobby and other internal aspects were designed by Philip Johnson. The building was completed in 1958, stands 515 feet (157 m) tall with 38 stories.

A report authored by scientists from United States Environmental Protection Agency has resulted some key U.S. projections of future climate changes, include future temperature changes, future precipitation and storm events, future ice, snowpack, and permafrost, future sea level change, and future ocean acidification.. The result are as follows: high temperatures above 90°F , heavy downpours occur about every four to 15 years, 25% increase in ocena acidity, sea level rise by about 6 feets.

Figure3: Climate Change in Seagram Building, Manhattan



DESIGN APPROACH

The approach that be taken to observe the issue and problem above is performance approach. The architectural term which use performance as design approach is called *performance based design*. Performance based design is approach to architecture in which building performance is a guiding design principle. This architecture places broadly defined performance above, or on a par with, form-making; it utilizes digital technologies of quantitative and qualitative performance-based simulation to offer a comprehensive new approach to the design of the built environment.

There are two kind of building performances that is noted in this design. They are building performance in protecting the users from the extreme climatic conditions and in facilitating the users' various activities inside the building.

Building performance in protecting the users from the extreme climatic conditions

In 2100, climate crisis that caused by high amount of CO2 has forced human to 'leave' earth. These are the simulations of climate crisis impact that happen to many buildings in Manhattan in 22nd century:

The usage of energy, especially energy that use for conditioning air in the building will increase, because high average temperature outside.

A number of floors in the lower part of building and the city infrastructures, like road, pedestrian way, etc, will never be used anymore, because of increasing sea level.

The buiding structures and other building elements that use iron as material will rust and corrode. The stone-based building elements will do likewise, they will obsolete, because of high intensity of acid rain.

The building structure will be more vulnerable to extreme amounts of precipitation and storm in 22nd century.

Those conditions and scenarios will be used as design reference in this project, the building performance in facing the extreme climate crisis, how the building protect the users inside it is a big part of the concideration of design.

Figure4: Polluted city cause climate crisis in the future
Source: CNN.com

Building performance in facilitating the users' various activities inside the building

In this case, timeframe context have big impact to various user activities. A significant increase in information and communication technology development in 22nd century will has changed almost all of human behavior in the office. Some scientists and futurists have established some predictions of 22nd century human behavior in the office. These are some predictions of the future office design criteria that written by Urmee Khan, a journalist of CNN, as the result of his interview with some experts. Those prediction is divided by three parts beased on the characteristic: workspace, communication, and technology.

What people seem to want most is flexibility, not just in the hours they work, but where they work. In a very short amount of time, a technological boom has allowed more employees to enjoy working from home.

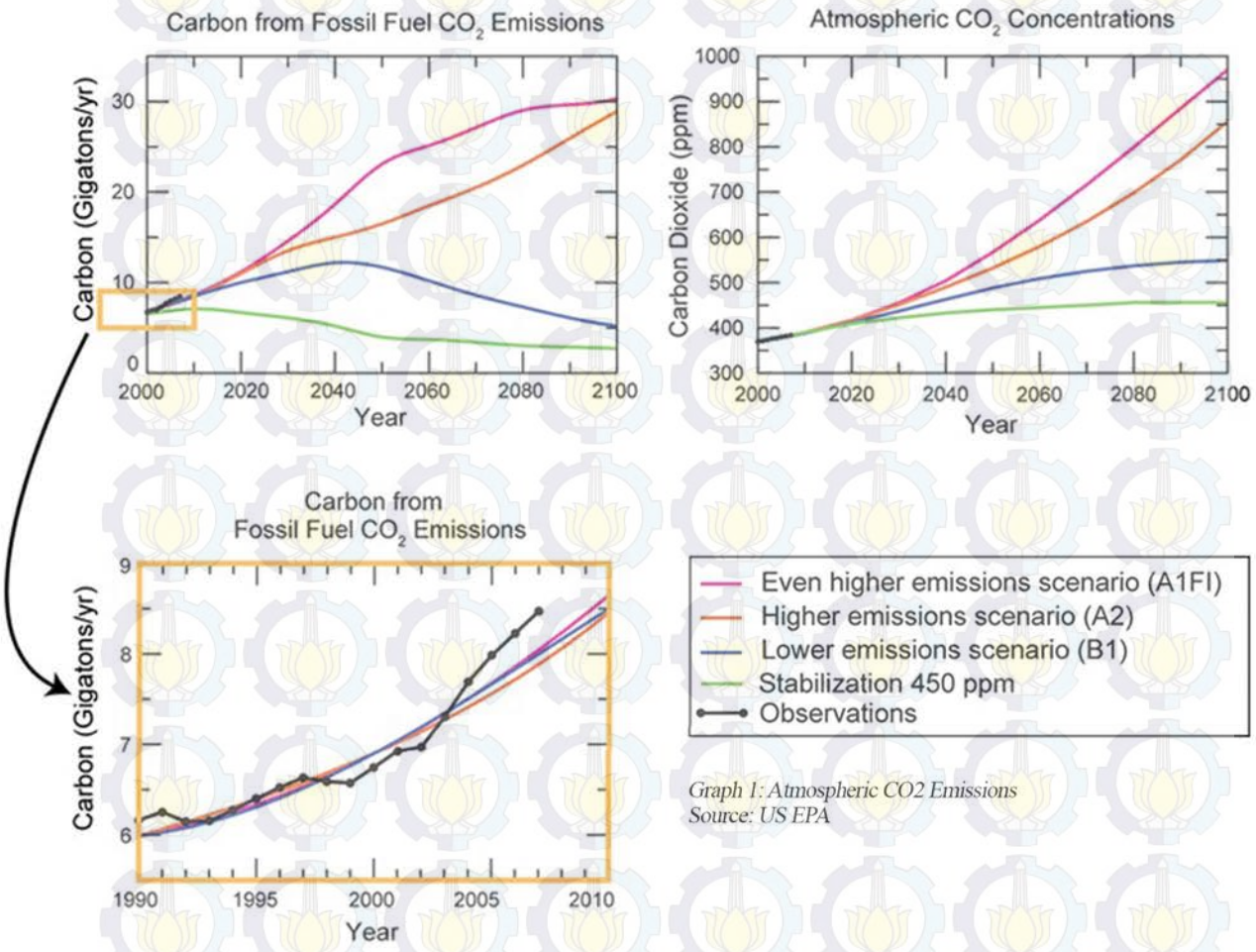
Greg Parsons, Vice President of Landscape Environments at Herman Miller, the office furniture manufacturer said, "There will be very different settings for different individuals. It will be about the individual not the brand. Some will prefer minimalist and others will prefer rooms like their grandfather's study. The office of the future will be more sensory. We will be able to 'talk' to every piece of furniture and they will be able to talk to each other to ensure temperature within the room is regulated for you."

Furthermore, video conferencing will be much better and according to Tom Cheesewright: "it will be very lifelike and steeped in VR".

Single transportation technology has been developed in the beginning of 21st century, therefore in 22nd century wheelchair will be a 'part' of human body and robot as well.

Future Climate Change

Souurce: US Environmental Protection Agency

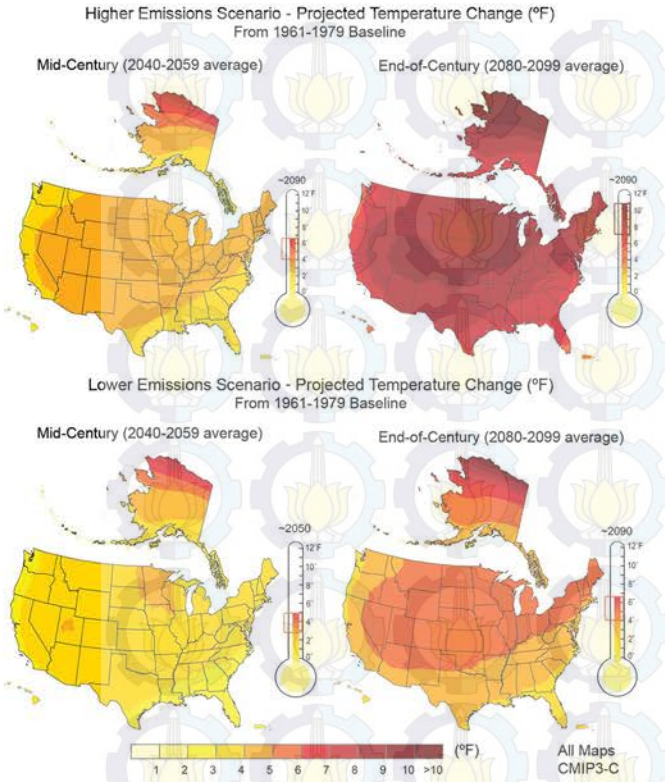


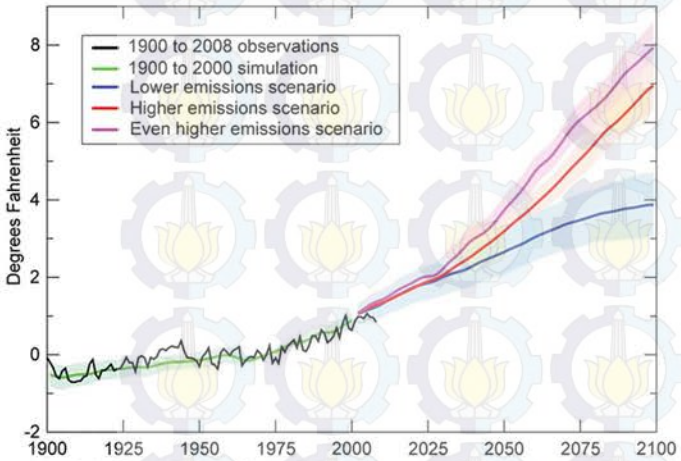
Graph 1: Atmospheric CO2 Emissions
Source: US EPA

Past and present-day greenhouse gas emissions will affect climate far into the future.

Many greenhouse gases stay in the atmosphere for long periods of time. As a result, even if emissions stopped increasing, atmospheric greenhouse gas concentrations would continue to increase and remain elevated for hundreds of years. Moreover, if we stabilized concentrations and the composition of today's atmosphere remained steady (which would require a dramatic reduction in current greenhouse gas emissions), surface air temperatures would continue to warm. This is because the oceans, which store heat, take many decades to fully respond to higher greenhouse gas concentrations. The ocean's response to higher greenhouse gas concentrations and higher temperatures will continue to impact climate over the next several decades to hundreds of years.

The figure above shows projected greenhouse gas concentrations for four different emissions scenarios. The top three scenarios assume no explicit climate policies. The bottom green line is an illustrative "stabilization scenario," designed to stabilize atmospheric carbon dioxide concentration at 450 parts per million by volume (ppmv).

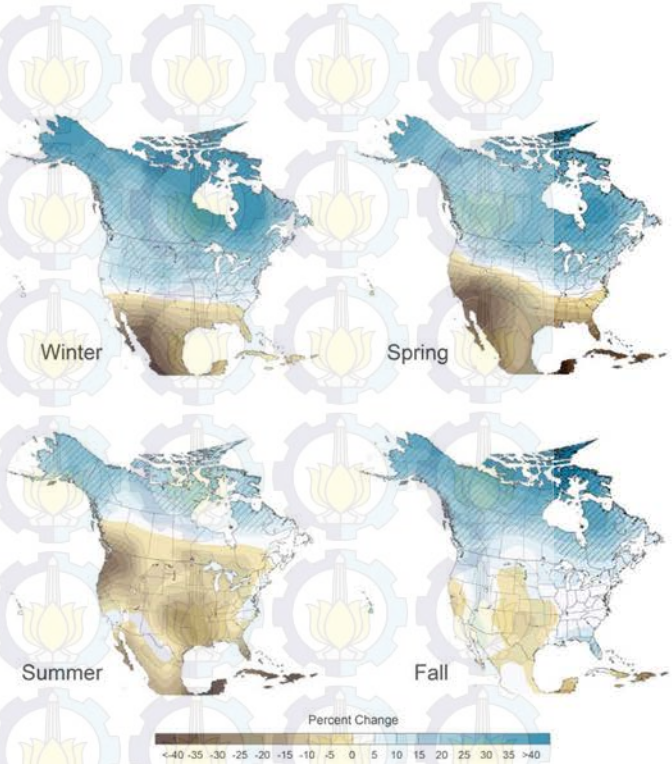




Graph 2: Temperature Change Projection
Source: USGCRP 2009

Future Temperature Changes: Key U.S. Projections

By 2100, the average U.S. temperature is projected to increase by about 4°F to 11°F, depending on emissions scenario and climate model. An increase in average temperatures worldwide implies more frequent and intense extreme heat events, or heat waves. The number of days with high temperatures above 90°F is expected to increase throughout the United States, especially in areas that already experience heat waves. For example, areas of the Southeast and Southwest currently experience an average of 60 days per year with a high temperature above 90°F. These areas are projected to experience 150 or more days a year above 90°F by the end of the century, under a higher emissions scenario. In addition to occurring more frequently, these very hot days are projected to be about 10°F hotter at the end of this century than they are today, under a higher emissions scenario.



Graph 3: Precipitation Change Projection
Source: USGCRP 2009

Future Precipitation and Storm Events: Key U.S. Projections

The maps above show projected future changes in precipitation relative to the recent past as simulated by 15 climate models. The simulations are for late this century, under a higher emissions scenario. For example, in the spring, climate models agree that northern areas are likely to get wetter and southern areas drier. There is less confidence in exactly where the transition between wetter and drier areas will occur. Confidence in the projected changes is highest in the areas marked with diagonal lines.

Northern areas are projected to become wetter, especially in the winter and spring. Southern areas, especially in the West, are projected to become drier. Heavy precipitation events will likely be more frequent. Heavy downpours that currently occur about once every 20 years are projected to occur about every four to 15 years by 2100, depending on location. More precipitation is expected to fall as rain rather than snow, particularly in some northern areas. The intensity of Atlantic hurricanes is likely to increase as the ocean warms. Climate models project that for each 1.8°F increase in tropical sea surface temperatures the rainfall rates of hurricanes could increase by 6-18% and the wind speeds of the strongest hurricanes could increase by about 1-8%. There is less confidence in projections of the frequency of hurricanes, but the global frequency of tropical hurricanes is likely to decrease or remain essentially unchanged. Cold-season storm tracks are expected to continue to shift northward. The strongest cold-season storms are projected to become stronger and more frequent.

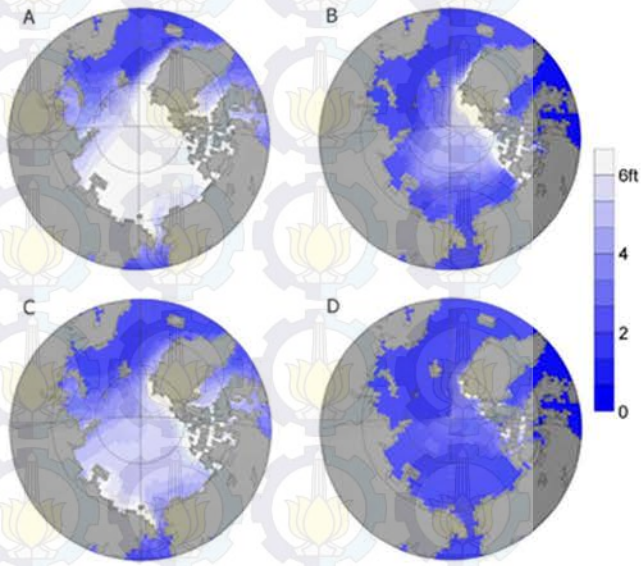
Future Climate Change

Souurce: US Environmental Protection Agency

Future Ice, Snowpack, and Permafrost: Key U.S. Projections

These maps show projected losses of sea ice. A and B show climate model simulations of sea ice thickness in March (A) and September (B) under current conditions. C and D show climate model simulations of sea ice thickness in March (C) and September (D) near the end of the 21st century. In the future, March is projected to have thinner ice (more blue in panel C); September is projected to be nearly ice-free (almost all blue in panel D).

Northern Hemisphere snow cover is expected to decrease by approximately 15% by 2100. Models project the snow season will continue to shorten, with snow accumulation beginning later and melting starting earlier. Snowpack is expected to decrease in many regions. Permafrost is expected to continue to thaw in northern lati-

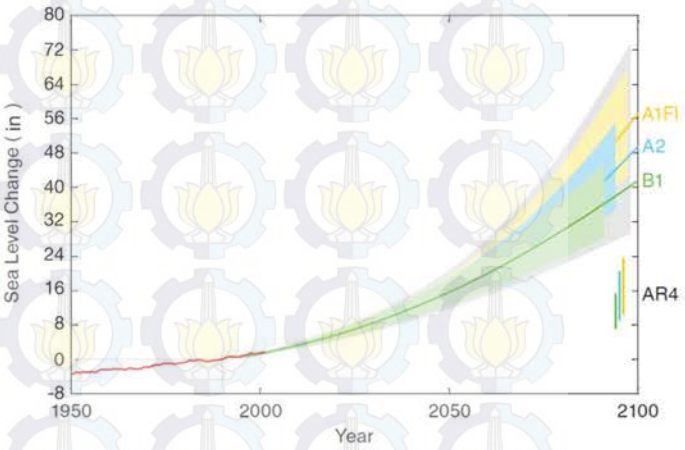


Graph 4: Sea Ice Loss Projection
Source: NRC 2011

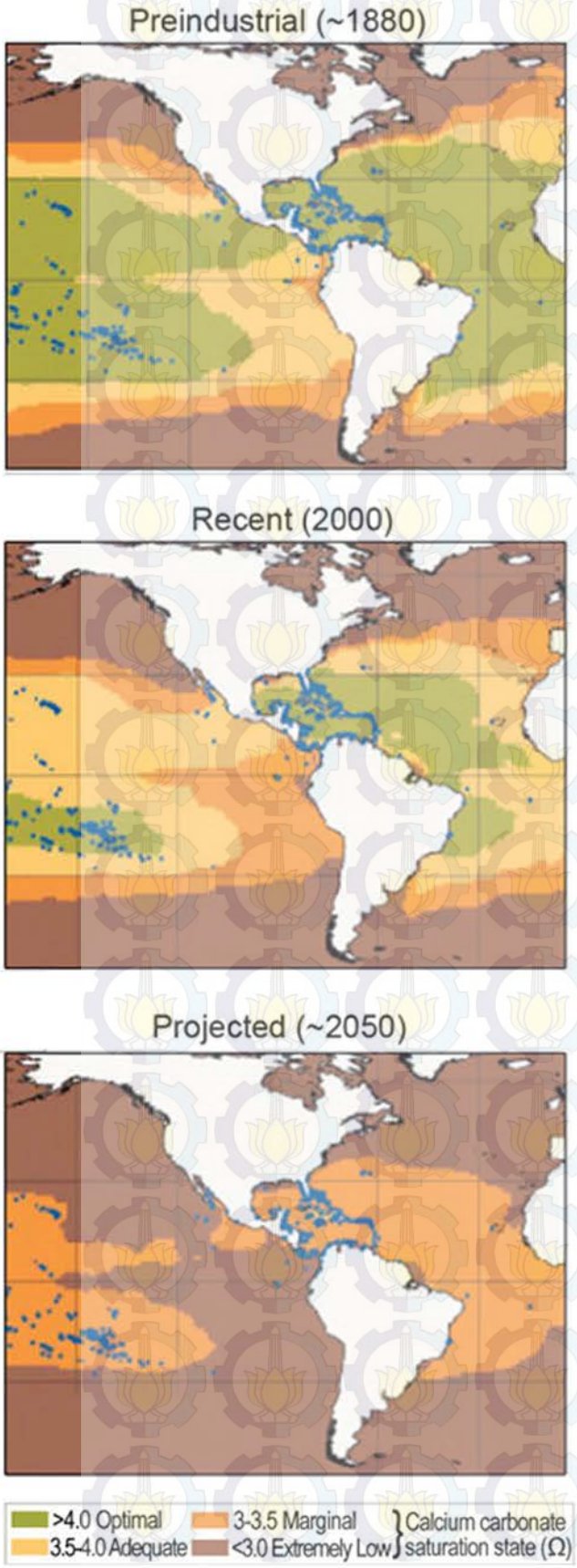
Future Sea Level Change

Warming temperatures contribute to sea level rise by: expanding ocean water; melting mountain glaciers and ice caps; and causing portions of the Greenland and Antarctic ice sheets to melt or flow into the ocean.

Line graph that shows sea level change from 1950 to 2100. Data from 1950 to 2000 shows moderate sea level rise from approximately negative four inches to approximately two inches. For the 21st century, sea level change is projected by four scenarios: AR4, B1, A2, and A1F1. Under the AR4 scenario, sea level change would increase by approximately sixteen inches by the end of the century. Under the B1 scenario the projected rise is approximately 40 inches; under the A2 scenario, approximately 48 inches; and under A1F1, approximately 56 inches by 2100.



Graph 5: Sea Level Rise Projection
Source: NRC 2010



Graph 6: Ocean Acidification Projection
Source: USGCRP 2009

Future Ocean Acidification

Oceans become more acidic as carbon dioxide (CO_2) emissions in the atmosphere dissolve in the ocean. This change is measured on the pH scale, with lower values being more acidic. The pH level of the oceans has decreased by approximately 0.1 pH units since pre-industrial times, which is equivalent to a 25% increase in acidity. The pH level of the oceans is projected to decrease even more by the end of the century as CO_2 concentrations are expected to increase for the foreseeable future.

Ocean acidification adversely affects many marine species, including plankton, mollusks, shellfish, and corals. Corals require the right combination of temperature, light, and the presence of calcium carbonate (which they use to build their skeletons). As atmospheric carbon dioxide (CO_2) levels rise, some of the excess CO_2 dissolves into ocean water, reducing its calcium carbonate saturation. As the maps indicate, calcium carbonate saturation has already been reduced considerably from its pre-industrial level, and model projections suggest much greater reductions in the future. The blue dots indicate current coral reefs. Note that under projections for the future, it is very unlikely that calcium carbonate saturation levels will be adequate to support coral reefs in any U.S. waters.

Figure5: City in 2100 Illustration
Source: Pinterest.com

Human in 2100

Cave Man Principle

Genetic and fossil evidence indicates that modern humans, who looked just like us, emerged from Africa more than 100,000 years ago, but we see no evidence that our brains and personalities have changed much since then. If you took someone from that period, he would be anatomically identical to us: if you gave him a bath and a shave, put him in a three-piece suit, and then placed him on Wall Street, he would be physically indistinguishable from everyone else. So our wants, dreams, personalities, and desires have probably not changed much in 100,000 years. We probably still think like our caveman ancestors.

The point is: whenever there is a conflict between modern technology and the desires of our primitive ancestors, these primitive desires win each time. That's the Cave Man Principle. For example, the caveman always demanded "proof of the kill." It was never enough to boast about the big one that got away. Having the fresh animal in our hands was always preferable to tales of the one that got away. Similarly, we want hard copy whenever we deal with files. We instinctively don't trust the electrons floating in our computer screen, so we print our e-mails and reports, even when it's not necessary. That's why the paperless office never came to be.

Based on Cave Man Principle, lifestyle of Manhattan society in 2100 is likely not much different from the life that happens in the present, except in some adaptation to technological development, like artificial intelegence, virtual world, etc.

Artificial Intelegence

by the year 2100 human will have very intelligent robots everywhere in our everyday lives. But we will not be apart from them—rather, we will be part robot and connected with the robots.

Virtual World

We will embrace the idea of temporarily living the life of a superrobot via surrogates but will be resistant to\ the idea of permanently living out our lives inside a computer or altering our body until it becomes unrecognizable.

Magnetic-Ball-Wheelchair

In 2100, the latest innovations have been found. Scientist and engineer successfully made magnetic-ball-wheelchair and finally human eventually no longer need to walk. Almost every-

Figure6: Office culture 2100 Illustration
Source: Pinterest.com

Office Culture 2100

In 2100, the spread of mobile working enables not only more effective use of space but also more extensive changes in work practices. There has been a move from personal rooms to open plan offices. This trend has reduced the size and number of individual work desks. Work involves a lot of different types of meetings and interactive situations. Spaces that accommodate such needs seems to meet well our customers merging needs.

Office Program

In this time, architectural programming of the office type building is determined by both kind of user and activity. For example, the spaces that needed as a minimum requirement of the office building are workstation, transition room, private room, additional room, and supporting room. However, in 22nd century, when human life (as well as the way people work) based on virtual technology and holography, space classification based on the type of users and activity is irrelevant. This happens because with the virtual and holographic technology, humans can do anything anywhere. So the intention that taken in arranging the office's architectural program in 22nd century is looked at efficiency, technology, and communication.

MORPHOSIS OF SEAGRAM BUILDING

The design purpose is to develop Seagram Building become more advanced to face climate condition and office culture in 2100. This object purposes the office model in year 2100 based on human beahvior that influenced by virtual and holographic technology along with extreme climate crisis happened on earth.

Figure7: Seagram Building
Source: ourdailypost.wordpress.com

DESIGN CRITERIA

Since there are two kind of building performances that is noted as design approach in this design, therefore the building design criteria also refers to the two approaches.

Building performance in protecting the users from the extreme climatic conditions

Required an envelope system that can reduce heat from the outside air due to the increase of earth's average temperature. In addition, the envelope must also be able to filter the air that goes into building

Materials and configurations of structure must able to survive high amounts of precipitation and storm.

Raise sea level cause a number of floors in the lower part of building can't be used anymore. So layout and spatial configuration must be reordered to meets spatial needs of the offices.

Building should be able to provide human needs which provided by earth's nature before.

Building performance in facilitating the users' various activities inside the building

Because in 2100 people can work anywhere and anytime, therefore office space must fulfill user's flexibility needs in working area.

Office space configuration should be able to make comunication between employees becaome easier.

Required furniture that adapt to advanced of information and telecomunication technologies in 2100.

POWERFUL SECONDARY SKIN

High amounts of precipitation, stom, and hurricane cause International Style buildings facing a serious problem. Their flat facades have to against wind movement, makes International Style building is prone to collapse. Required a secondary skin that able to protect the building from the disaster.

Basic Form Principle: Curvy

Compared with sharp or flat skin, curvy skin is more able to face hurricane and heavy precipitation because curvy skin let the wind pas fluently through the skin.

Developing Skin Form :

Considerations in designing the skin form are the form of the existing building, relationships between form, stability, and strength of the structure, and resistance to various disasters.

Gradation of Shape

The skin is formed by two basic forms: triangle and circle. The bottom floor uses triangle form and the top floor uses circle form. The body is a change a triangle to a circle by shape gradation.

Planar Rotation

Gradual change of direction of the unit forms. The formed shape is rotated without diversion from the plane.

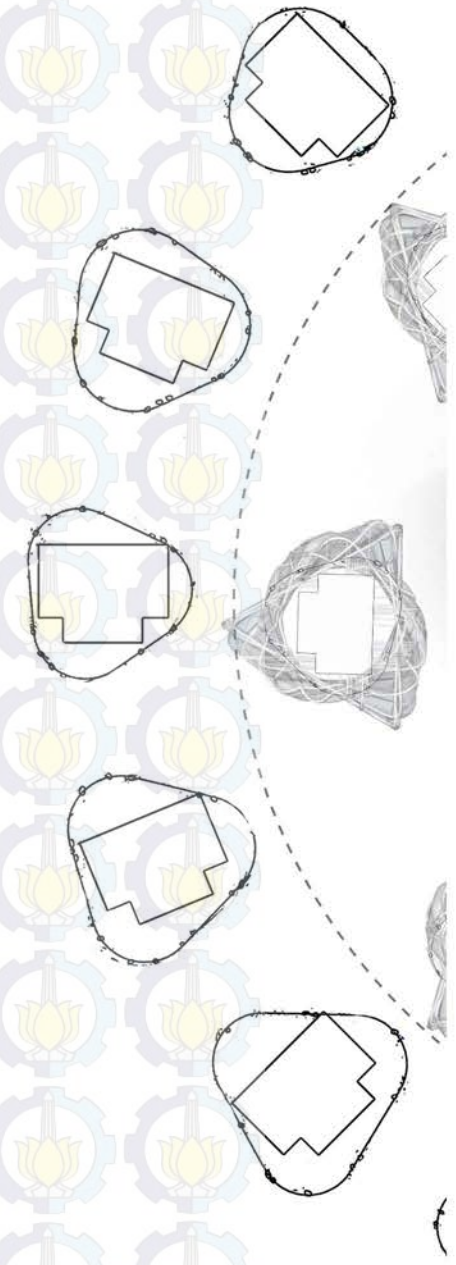
Skin structure

The structure consists of main structure and substructure. The main structure is an exoskeleton structure, formed by intersection of voronoi diagram and skin form. The substructure is arranged by rigid pattern.

Skin Material

Carbon nanotube

Cylinder-like tube made entirely of carbon. The size of a nanotube is expressed on nanoscale (one millionth of a miilimeter equals one nanometer). Really strong, 200 times stronger than steel, with one of highest strength-to-weight ratio of any known material. They posses good mechanical, electrical, and thermal properties.



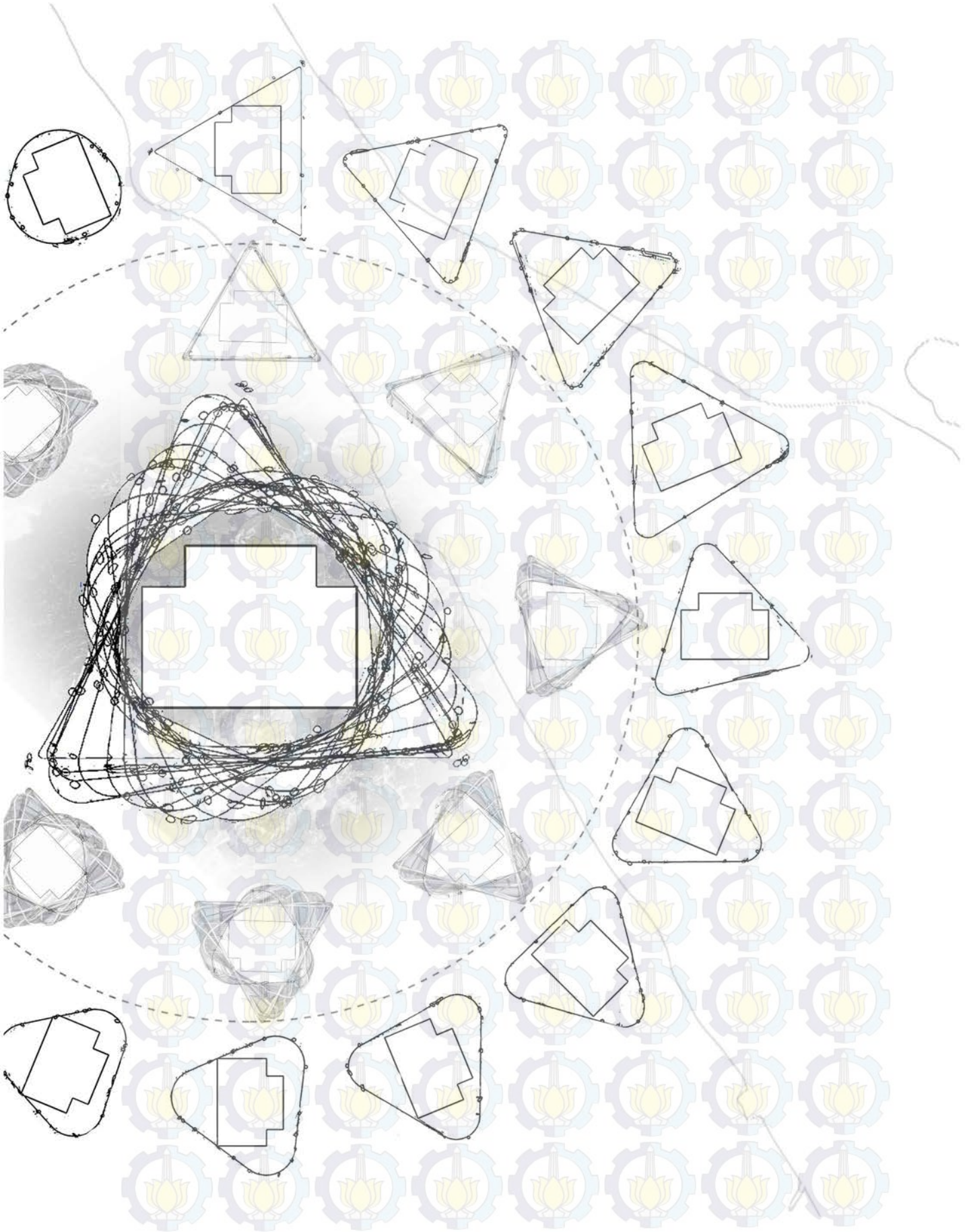
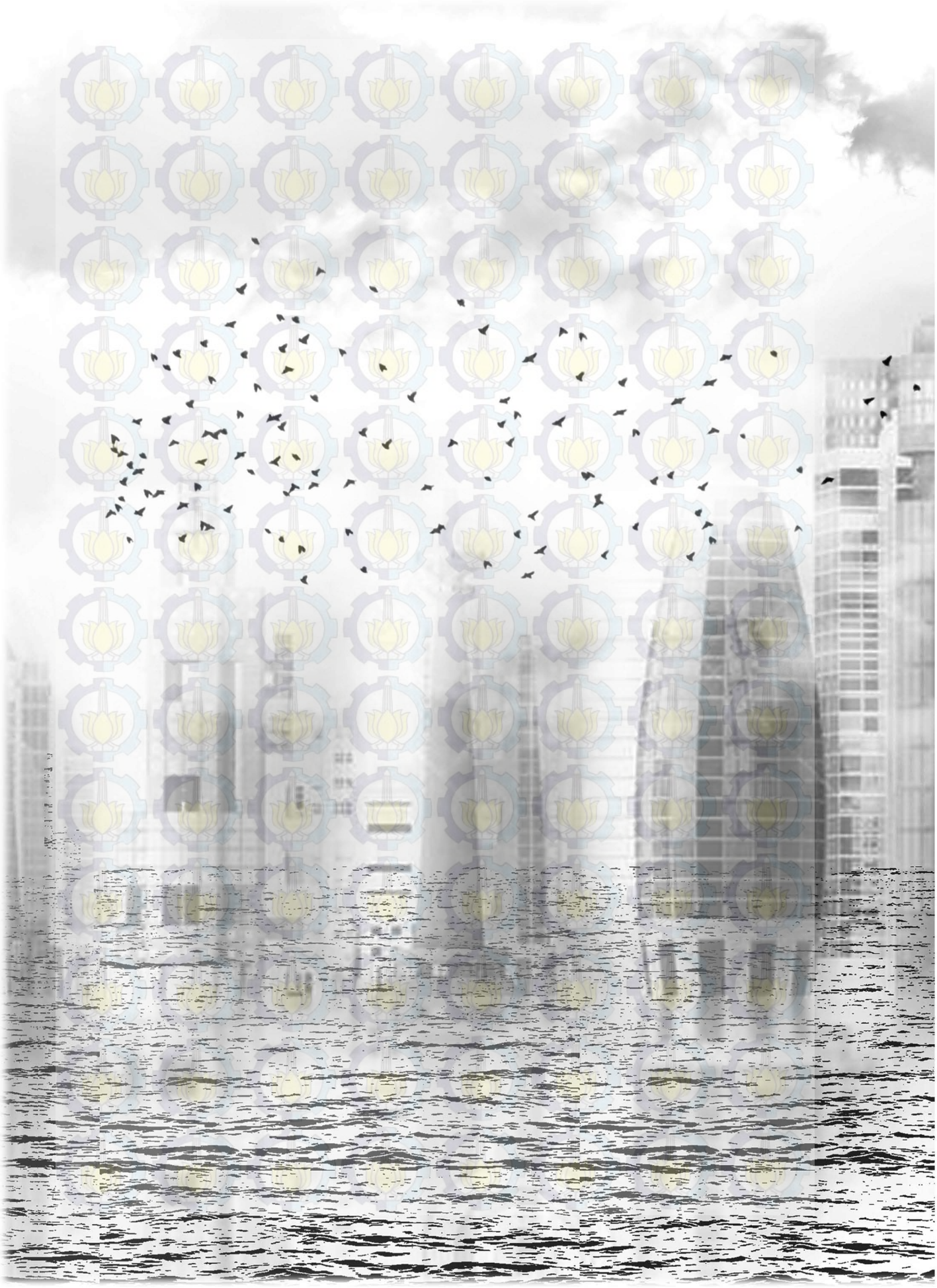


Figure9: Shape gradation



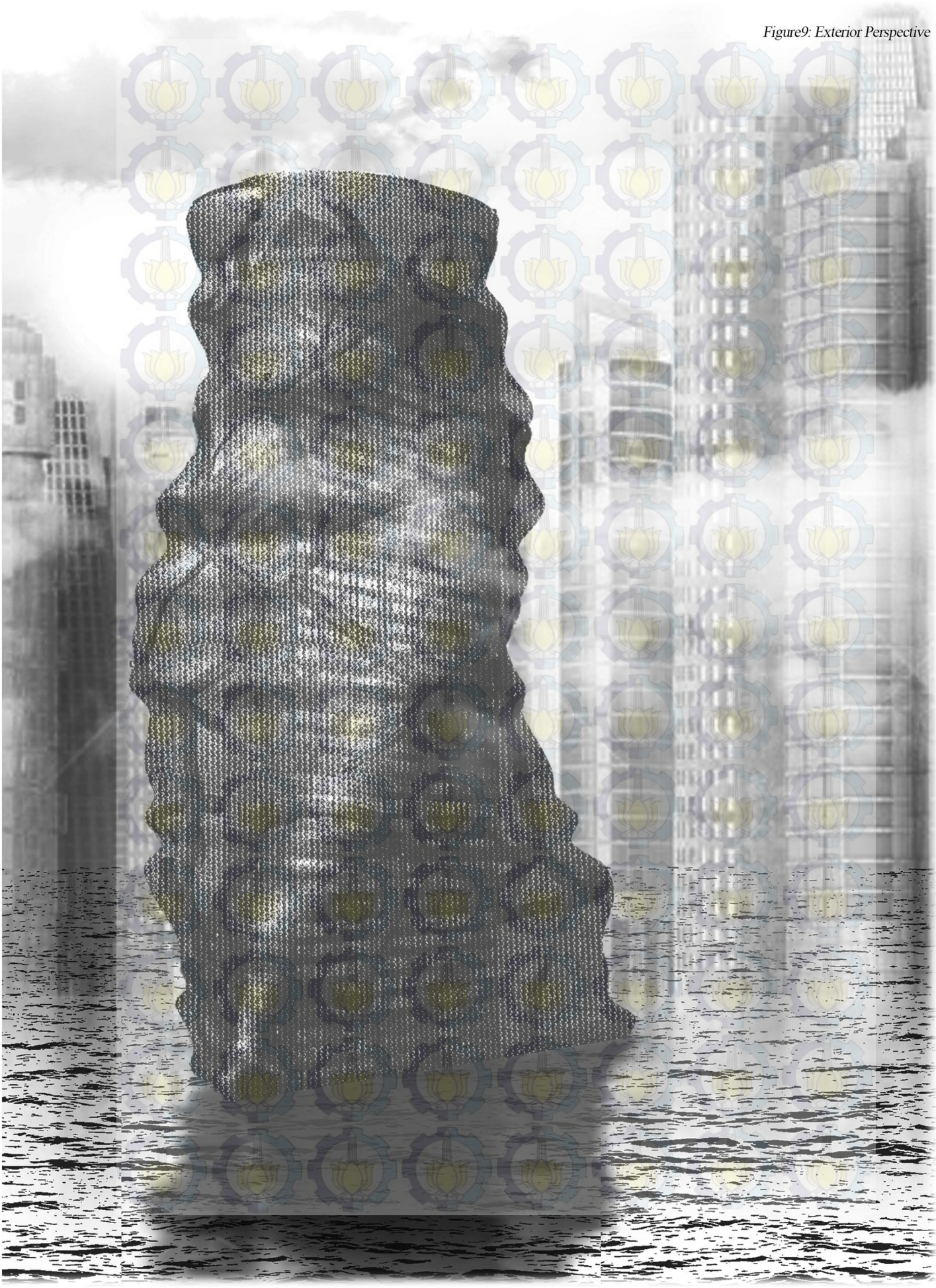


Figure9: Exterior Perspective

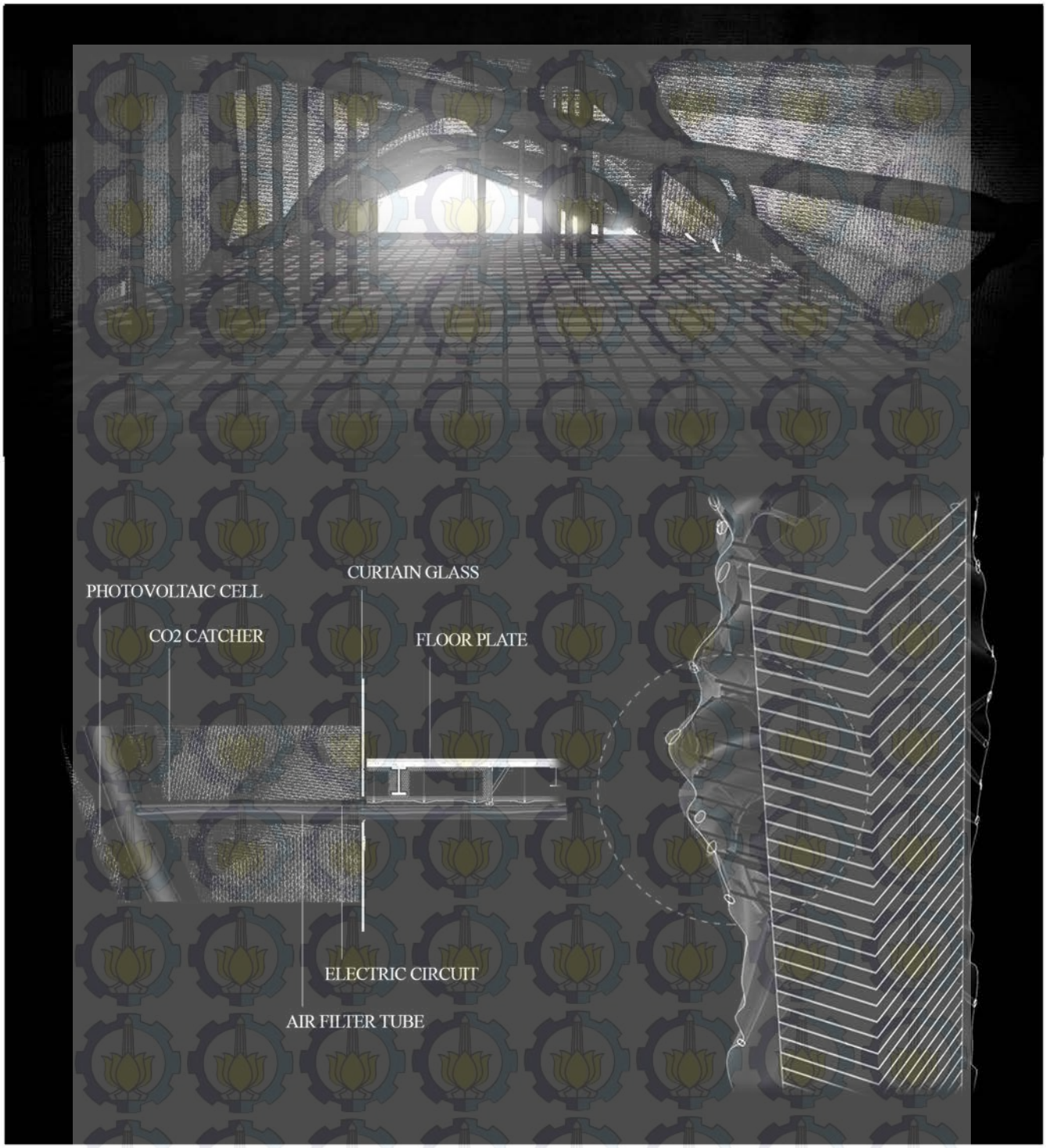


Figure10: Carbon dioxide removal diagram

CARBON DIOXIDE REMOVAL

Carbon dioxide removal (CDR) installation is capable of removing carbon dioxide from the air and releasing oxygen using a proccess called "humidity swing".

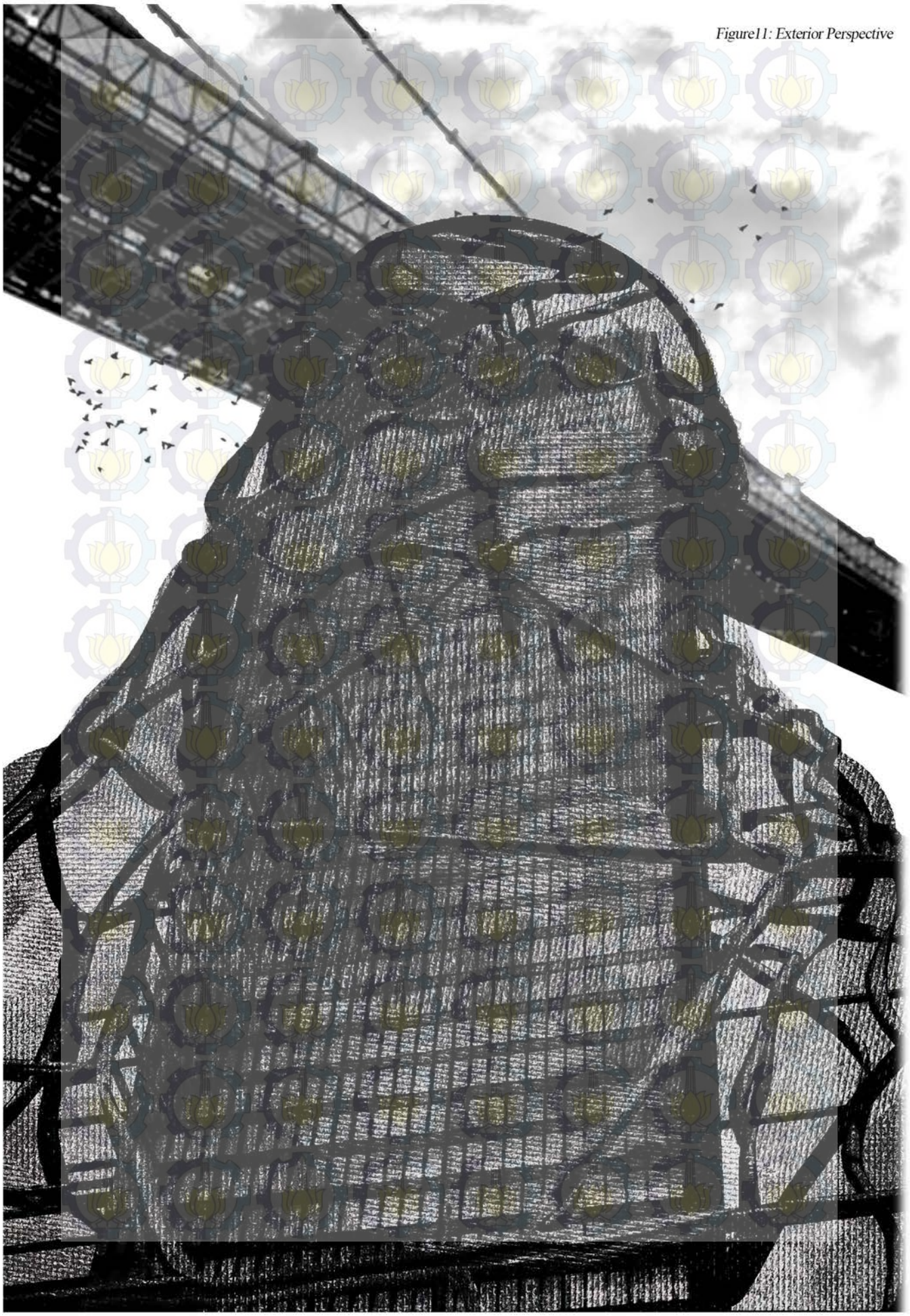
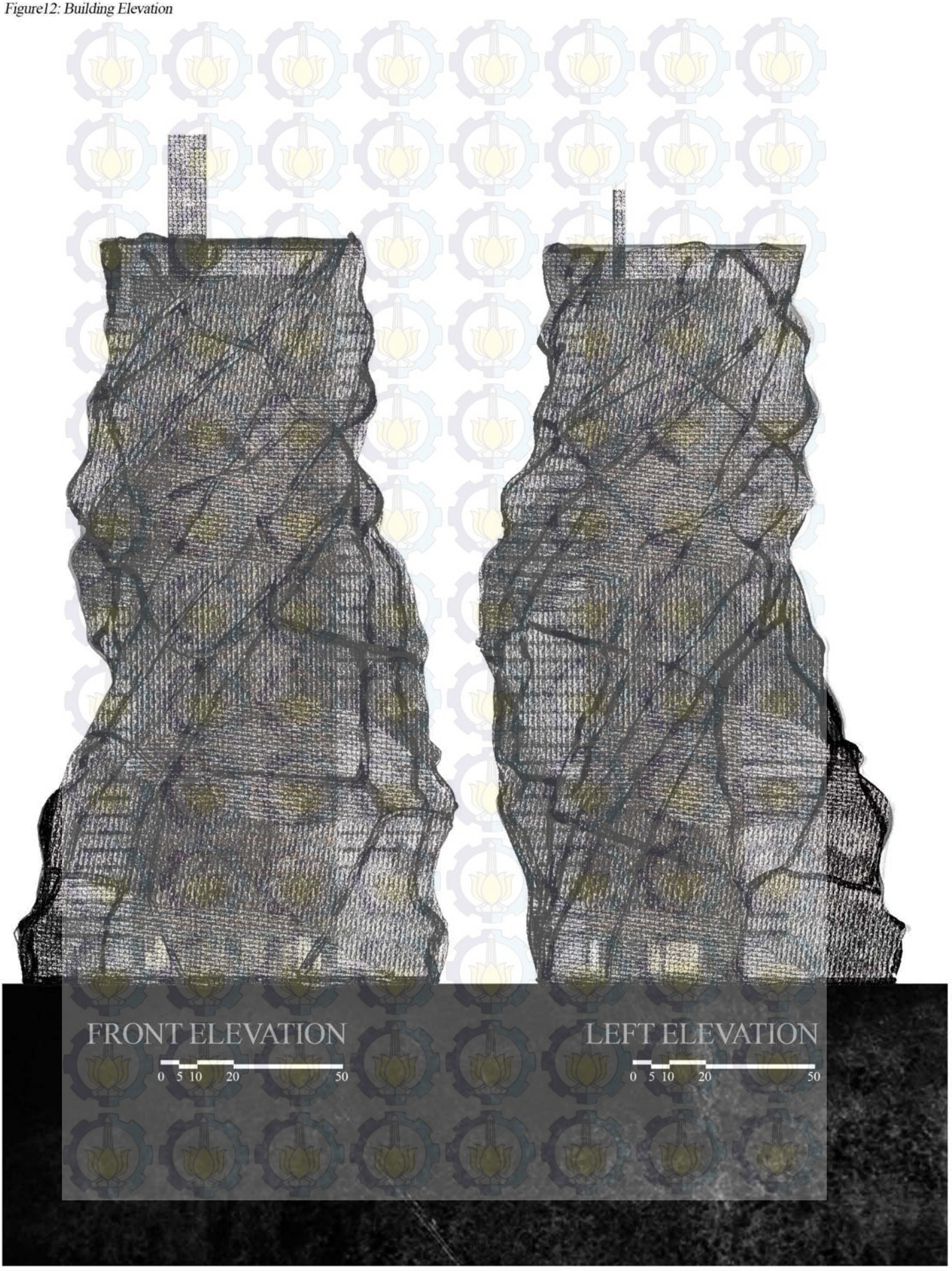
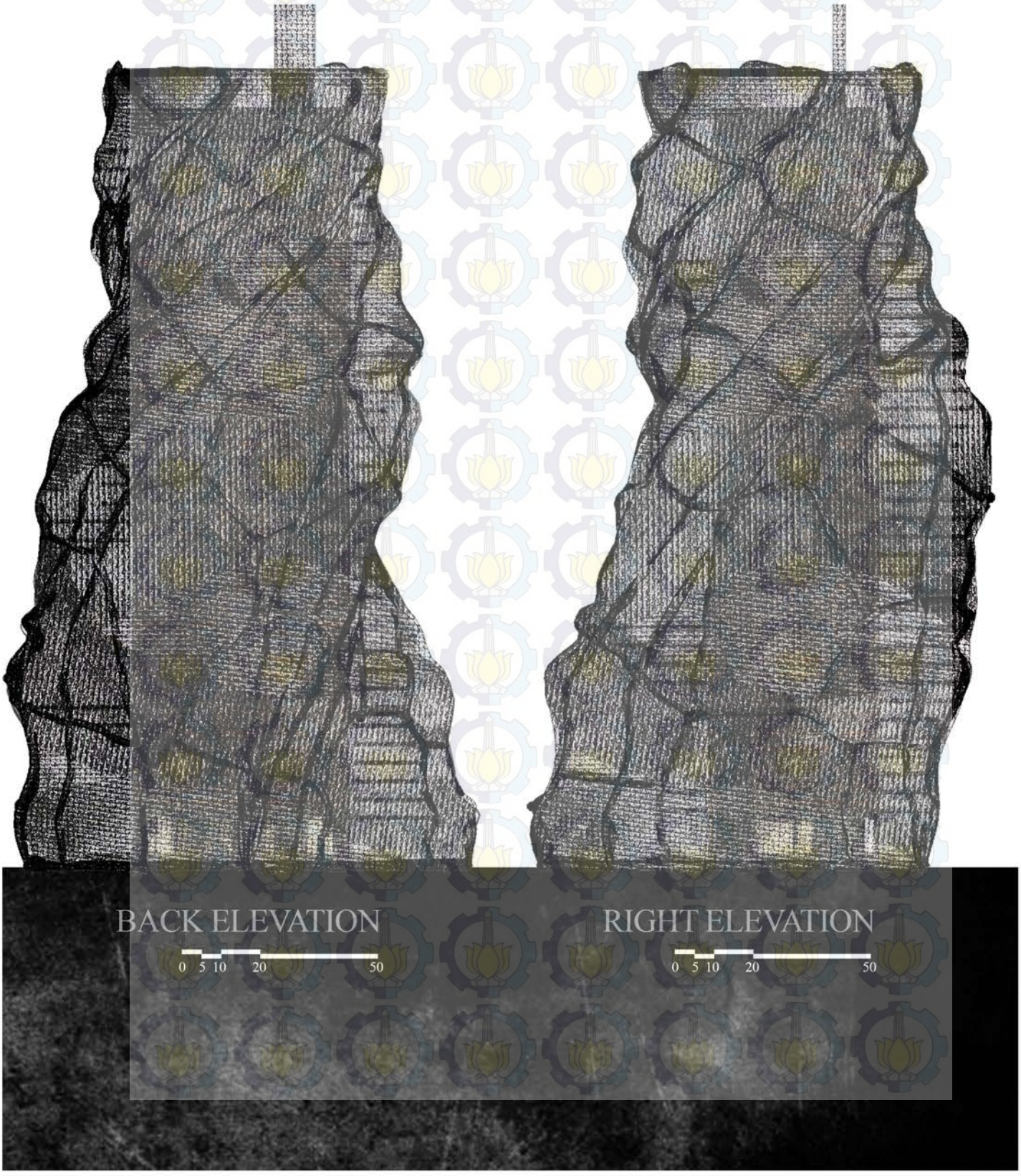


Figure11: Exterior Perspective

Figure12: Building Elevation




BACK ELEVATION
0 5 10 20 50
RIGHT ELEVATION
0 5 10 20 50

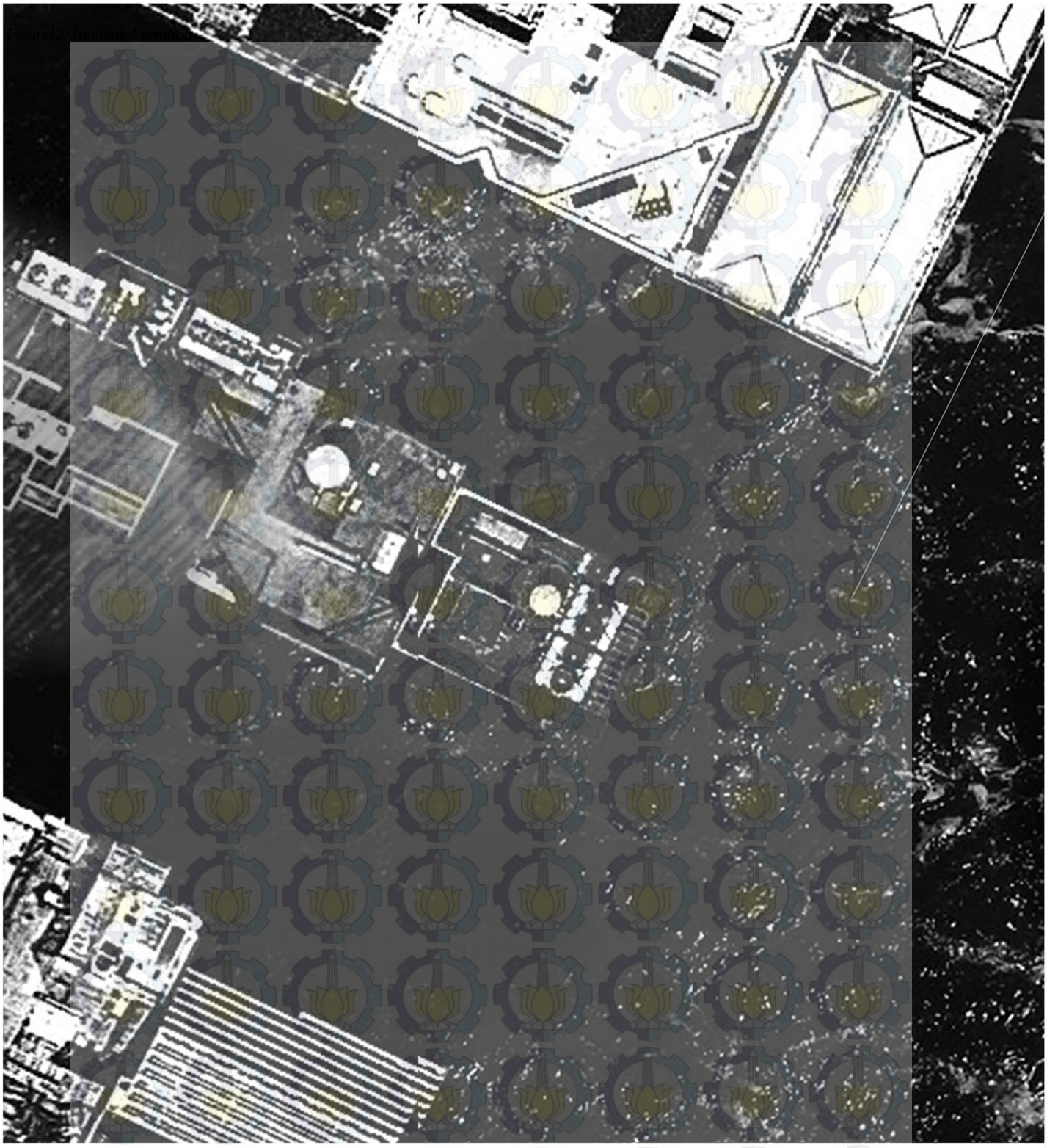


Figure13: Site Plan

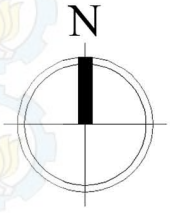
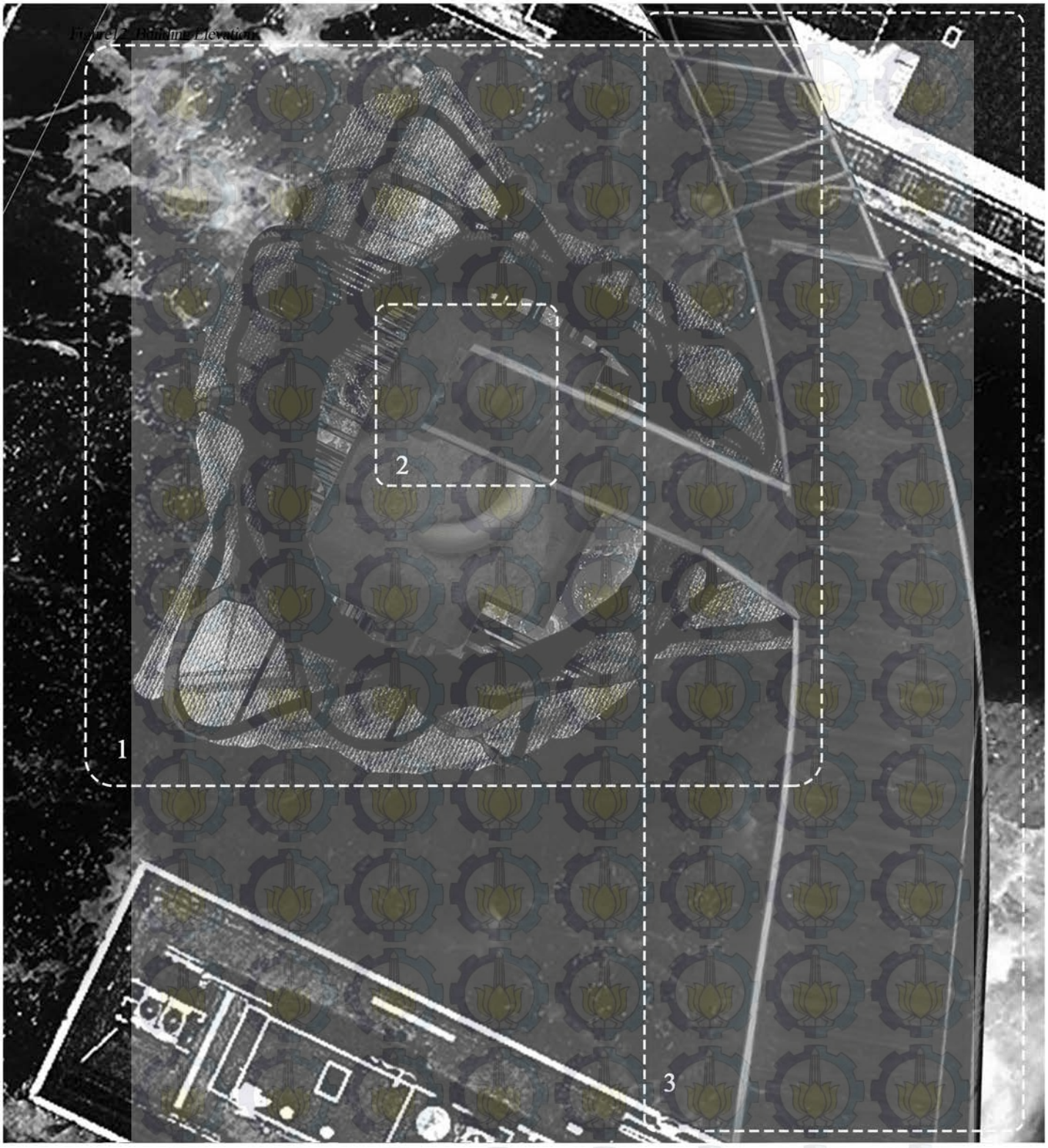


Figure 2.2 Building Elevation



SITE PLAN

0 5 10 20 50

1. Seagram Building
2. Entrance Area
3. Sky Road

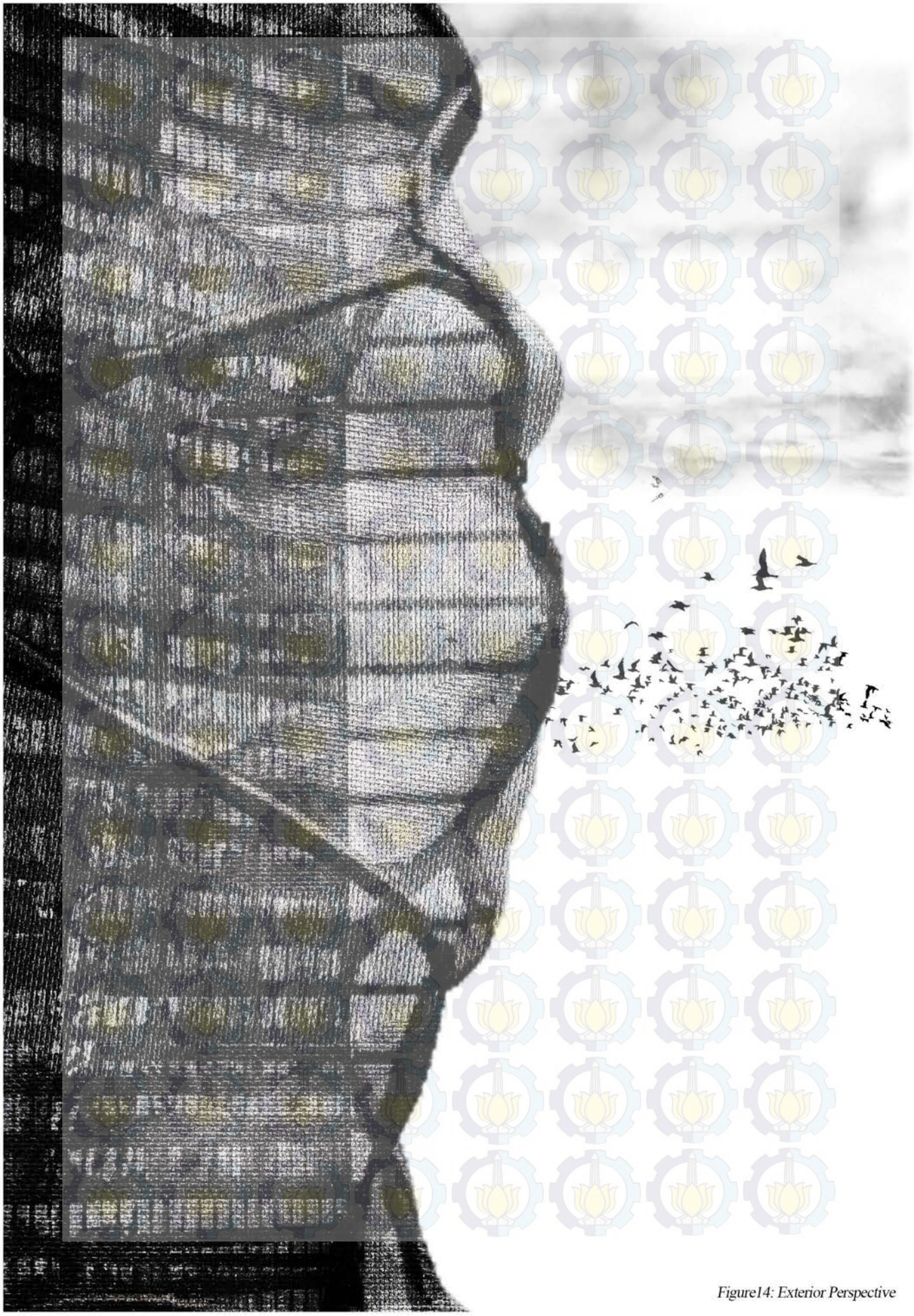
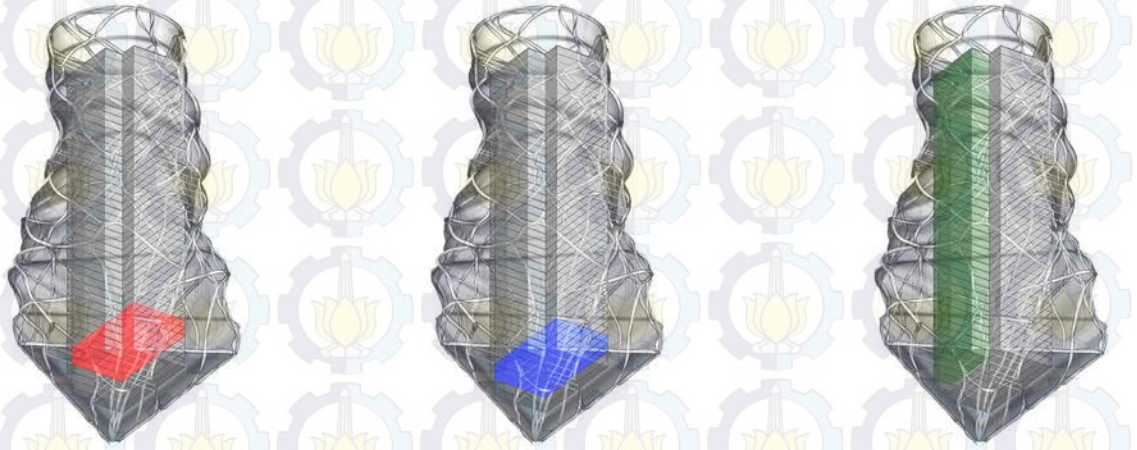


Figure14: Exterior Perspective

Upside-Down Entrance
Since the city infrastructures have been built above the city, the entrances of all buildings in Manhattan move to the top of the building, as well as Seagram Building

Restaurant
Without waiters. Machines have replaced the role of waiter. Apps on smartphone will let machines peruse the menu, order, and pay for lunch.

Rental Office
Outfitted with automation furnitures, like hologram table that able to render 3-D holograms of real-world objects using combination of proprietary software and special lenses and lights.



Utilities
The center of automation utilities that control of the whole building utilities automatically.

Water Management
Water becomes the main problem in 2100. Therefore every building needs water management units in their own.

Services and Circulation
Vertical circulation using floating-magnetic elevator and utilities, shaft, and service area each floor.

Figure15: Building Program

PROGRAM

***Reverse** Existing Program*

The concept of the new building program is reverse the existing one. The reason is because the entrance of the building is shifted to the top of the building. The new program has lobby on the top-most story, restaurant below it, and many stories of rental office below the restaurant. The utility stories is placed on the bottom story, which is on the top story before.

UPSIDE-DOWN ENTRANCE - LOBBY DESIGN

Since the city infrastructures have been built above the city, the entrance of all buildings in Manhattan move to the top of hte building, as well as Seagram Building.

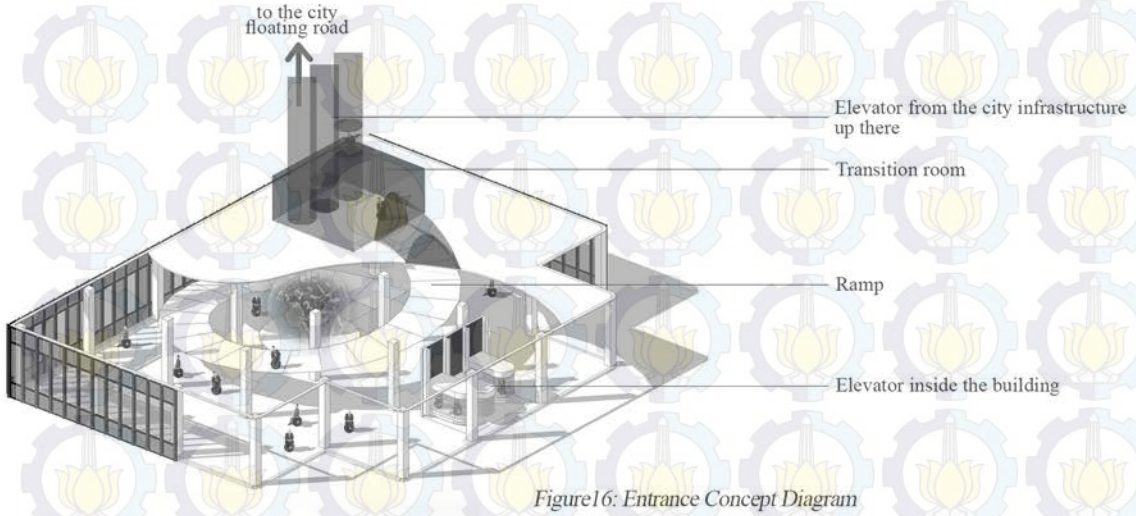


Figure16: Entrance Concept Diagram

Figure17: Lobby Interior

Figure18: Lobby Interior

Lobby Plan

1. Ramp
2. Large Hologram Table
3. Restroom
4. Floating-Magnetic Elevator
5. Automation Utility Room

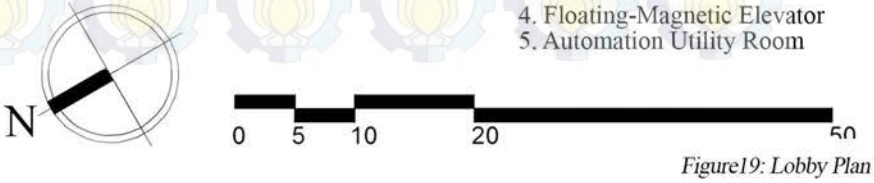


Figure19: Lobby Plan

OFFICE DESIGN

In 2100, the concept of the office is focusing on three sectors: efficiency, technology, and communication. There are three main features in this design: (1) flexible placement of work area that everyone can use; (2) layout and circulation system that make users communication more efficient; (3) and furnitures that adapt to technological advances.

Research 1

Office worker personality

In this time, architectural programming of the office type building is determined by both kind of user and activity. For example, the spaces that needed as a minimum requirement of the office building are workstation, transition room, private room, additional room, and supporting room. However, in 22nd century, when human life (as well as the way people work) based on virtual technology and holography, space classification based on the type of users and activity is irrelevant. This happens because with the virtual and holographic technology, humans can do anything anywhere. So the approach that taken in arranging the office's architectural program in 22nd century is looked at the perspective of personality. We can look at the physical, social and virtual space requirements with respect to the four different people types: navigators, anchors, connectors and collectors.

Anchors

spend all their days in the office, doing most of their work while sitting behind their desks

Connectors

spend half their working days in different premises of the organisation

Collectors

are responsible for the organisation's relationship with the outside world

Navigators

are often the key persons of the organisation and they have extensive responsibilities

Research 2

Existing plan

Open Plan

Seagram Building is a scyscraper that designed as open plan, the floor plan which makes use of large, open spaces and minimizes the use of small, enclosed rooms such as private offices. So, basically there's no obstacle in designing a new type of office.

Inside/Outside relationship

All sides of the building are built with ceiling-to-floor curtain windows.

Lighting

Ceiling-to-floor curtain windows on all sides of the building allow for complete natural lighting.

Working Pattern

Retangular structure permutation is not efficient for the collaborating and communicating. It's rigid, one-dimension, and lacking efficiency.

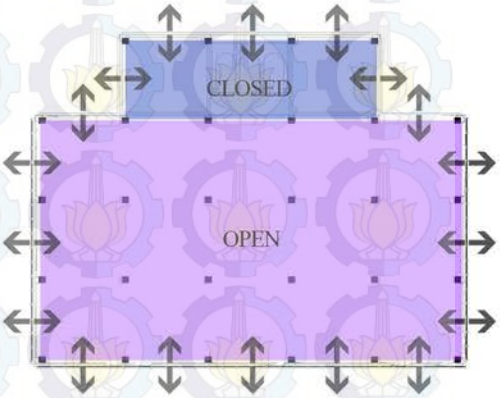


Figure20: Existing Condition of Seagram Building

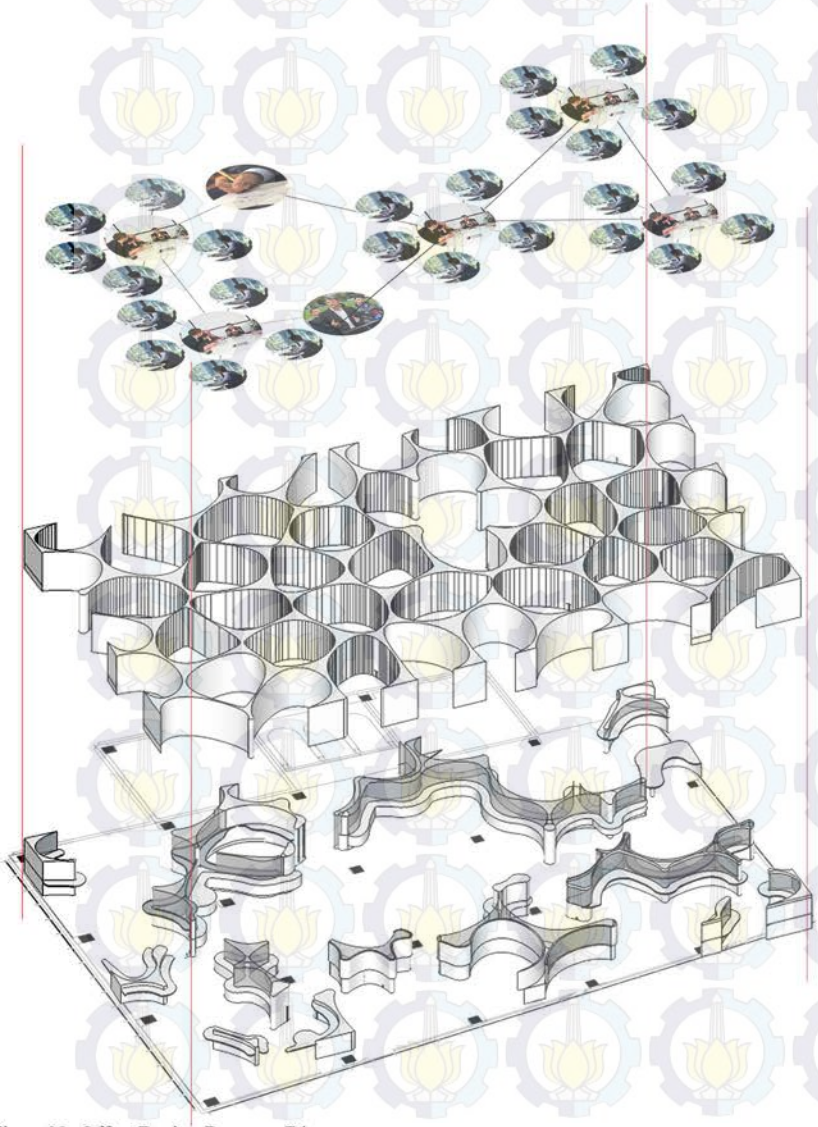
Concept

Spatial Organization
Sprawl organizarion is chosen because in the future productivity will lead the way of work and efficiency become needs. Collector space as center of function because the workstation of collectors is a venue for brainstorming and planning sessions.

Curvy Boundary nad no more Door
Curvy boundary is able to accomodate the wheel and no more door needed for a room because door decrease the efficiency and the employee can work privately in their own holographic 'world'.

Dividing Space: Voronoi Diagram
Sparwl organization requires spreading spatial distribution with similar dimension. Voronoi diagram is able to answer that needs.

Figure21: Work Cell Concept Diagram

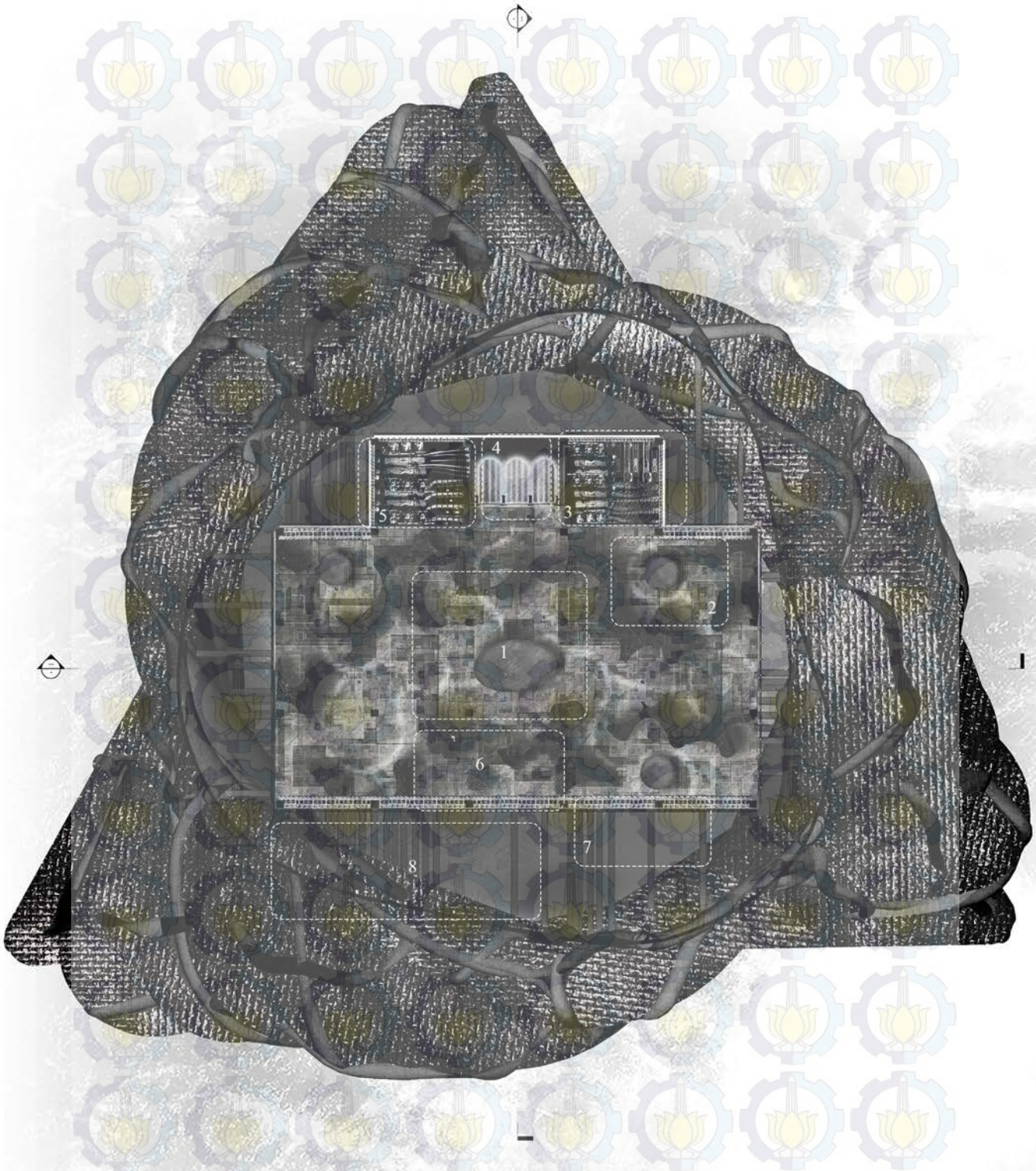


SPRAWL ORGANIZATION
To improve efficiency in communication, the cells is spread to all sides, with Connector space as center of cell.

VORONOI DIAGRAM
Voronoi diagram could divide space in similar dimension with flexible configuration.

DESIGN RESULT
Superimposing sprawl zoning on voronoi diagram. Some of voronoi 'walls' is removed for circulation space.

Figure22: Office Design Proccess Diagram



Office Plan

1. Central Conference Area
2. Flexible Work Area
3. Restroom
4. Floating-Magnetic Elevator
5. Automation Utility Room
6. Cafetaria
7. CO_2 removal

Figure23: Office Plan

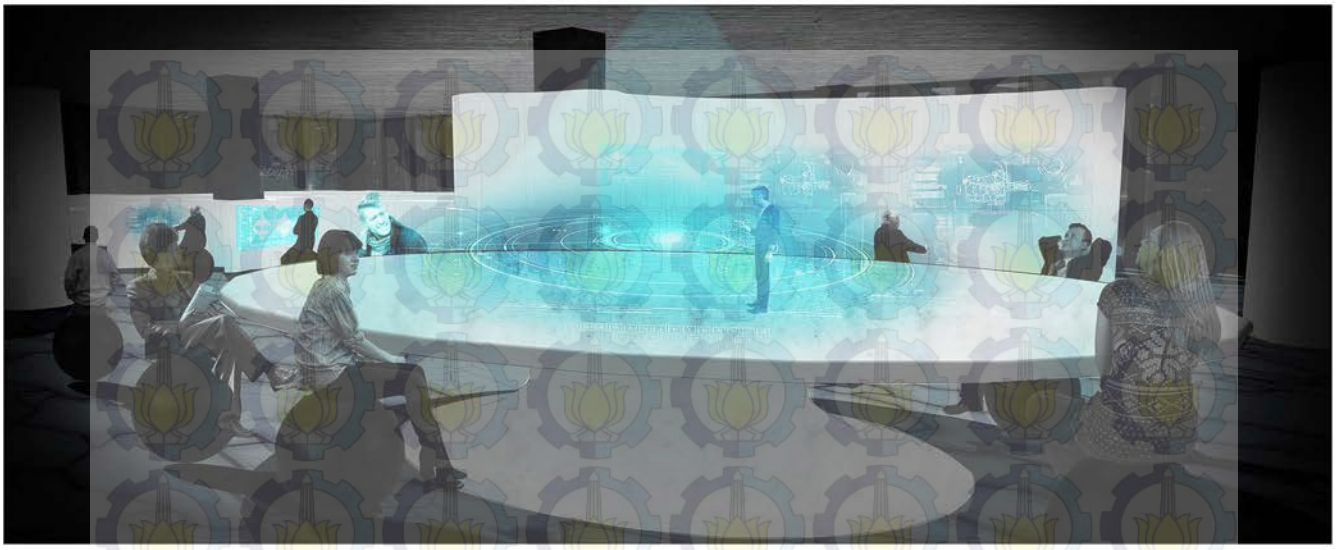


Figure24: Office Interior (Central Conference Area)

Figure25: Office Interior (Flexible Work Area)

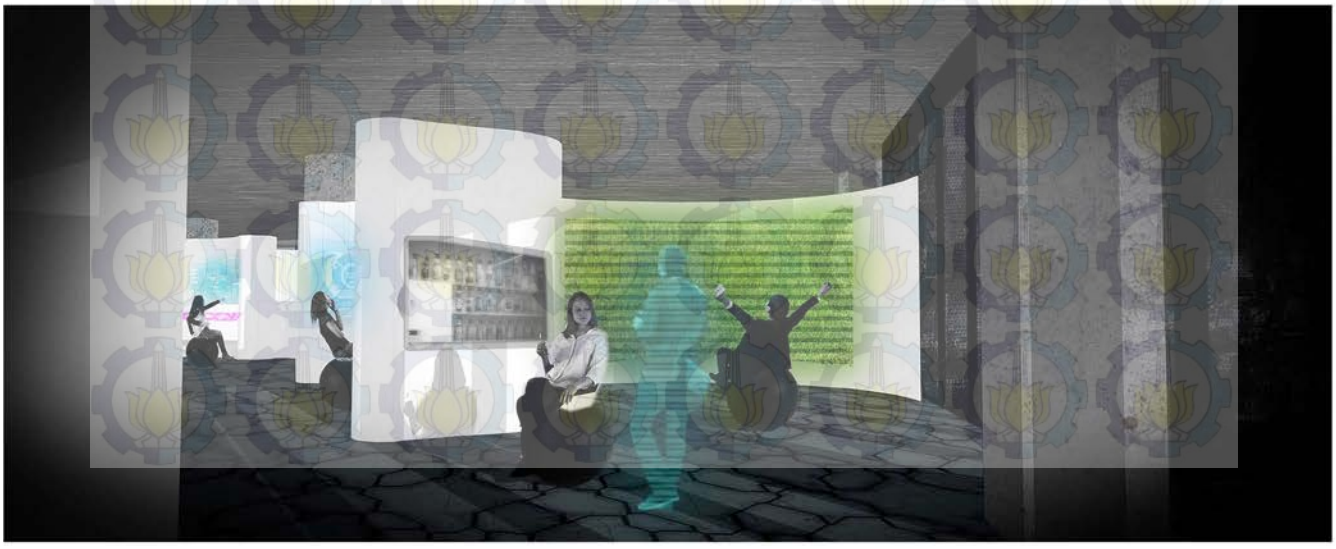


Figure26: Office Interior (Cafetaria)

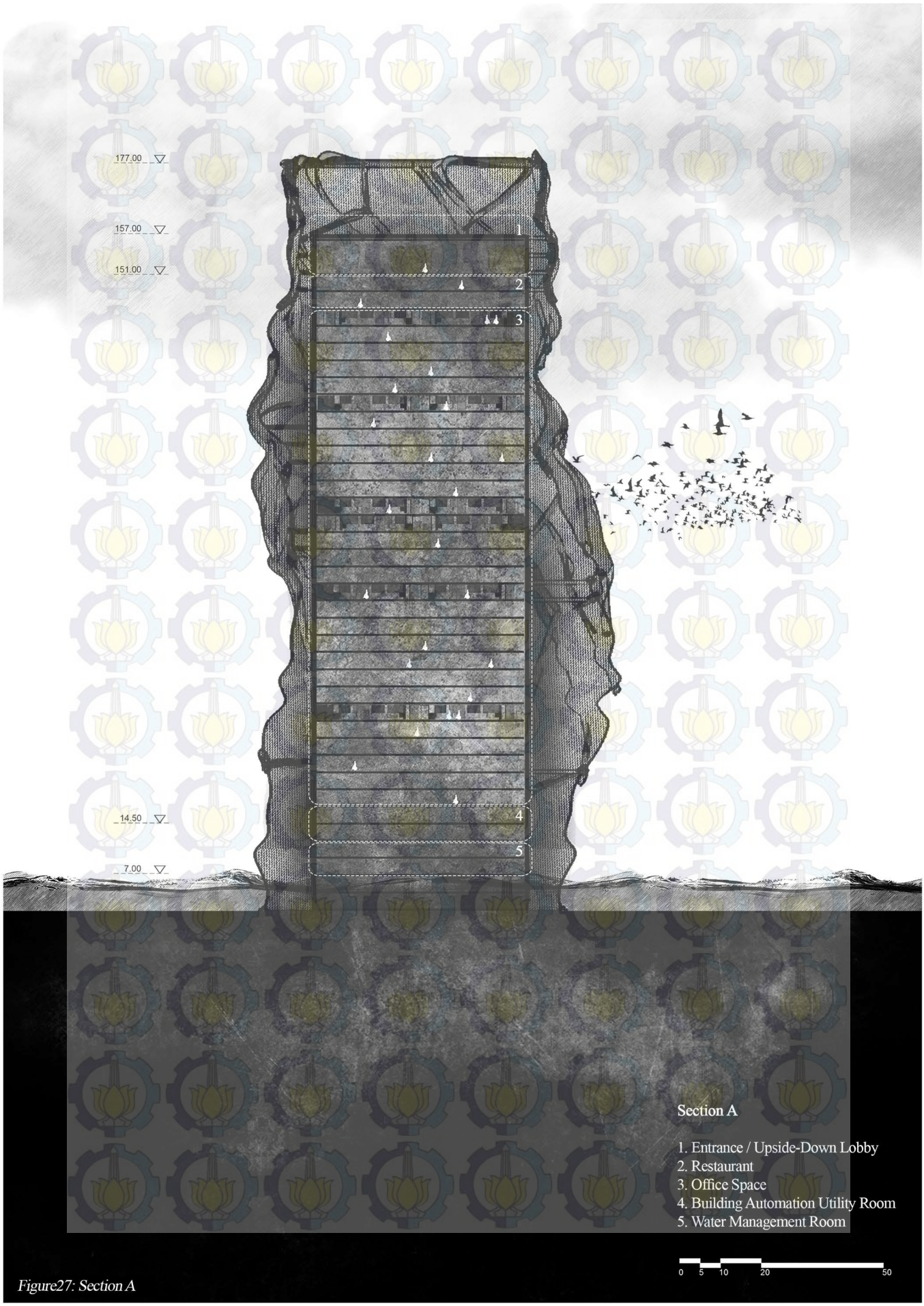


Figure27: Section A

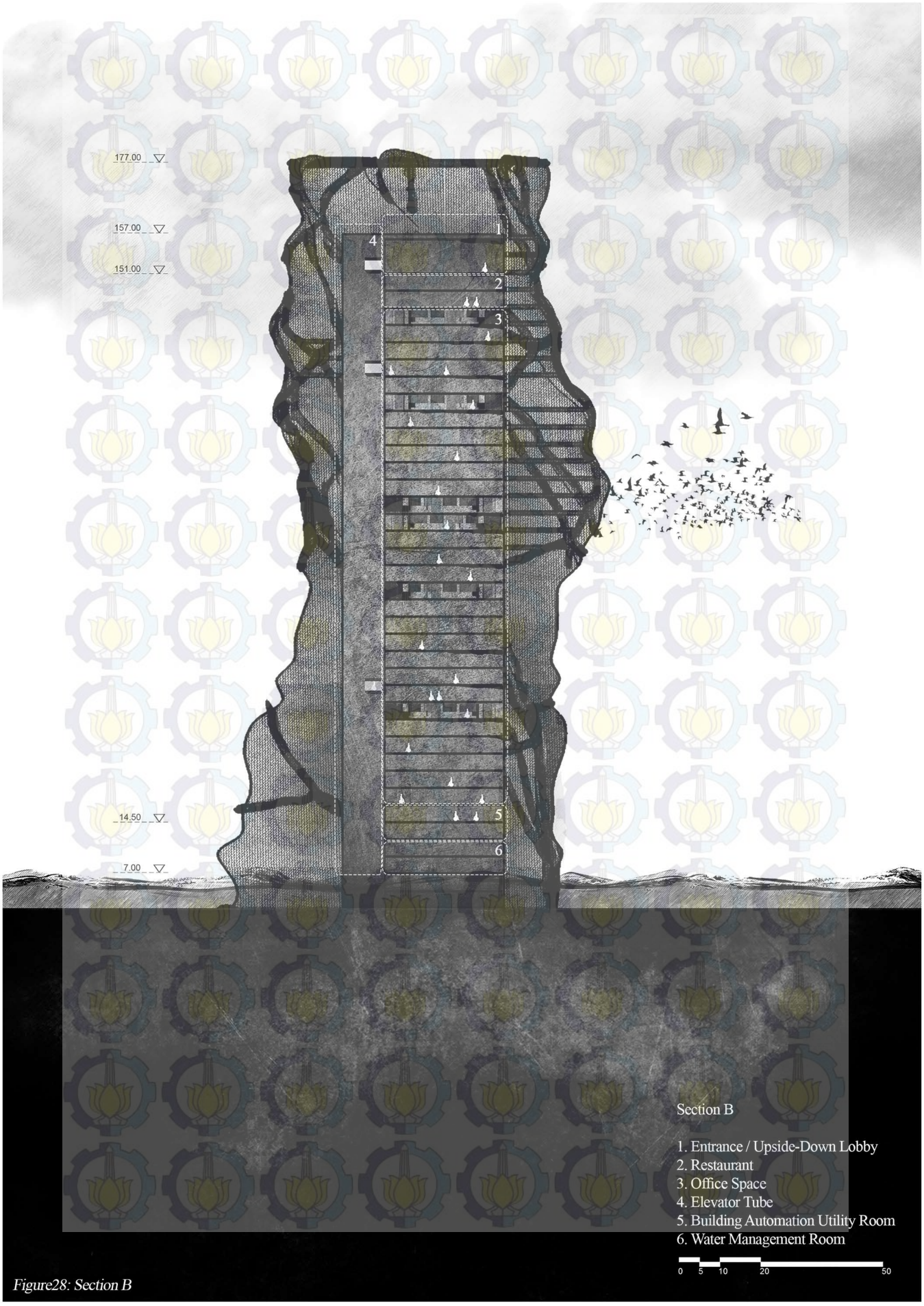


Figure28: Section B

CONCLUSION

Seagram Building is a well-known modern era skyscraper that need to adapt with 22nd century climate condition. Powrul secondary skin would protect Seagram Building from climate crisis. Office design in 22nd century also would look much different with office design in this era. Design would be more user-friendly and automatic device would fill many spots in the office since almost everything controlled automatically. The design would also make worker movement and communication more efficient.

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